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Current Awareness Service for Toxic Substances (CATS). Cumulative Report Number 2. Part II

Arthur D. Little, Inc, Cambridge, Mass.

Prepared for

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16. ABSTRACT

This cumulative report contains 26 current awareness documents prepared biweekly from 25 August 1975 through 9 August 1976 during the second year of a two year project. The purpose of this project was to provide the Office of Toxic Substances (OTS), U.S. Environmental Protection Agency with information on new uses of existing chemical products and with information of obvious potential environmental concern for both new and existing chemical products.

For each biweekly document a core list of approximately 80 journals was scanned for information of interest to OTS on more than 30 topics (compounds, classes of compounds, and subject areas, e.g., model ecosystems). Abstracts were prepared for all items selected and these abstracts were presented biweekly under the assigned topics. In addition, a "General Information" section was added to accommodate abstracts for topics not included in the original list of scanning topics. Biweekly subject indexes were cumulated for this annual compilation, and an author index was added.

17. KEY WORDS AND DOCUMENT ANALYSIS

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CURRENT AWARENESS SERVICE
FOR
TOXIC SUBSTANCES

CUMULATIVE REPORT NO. 2
PART II

November 1976

Contract No. 68-01-2694

Ernest W. Stalder
Project Officer

Office of Toxic Substances
Environmental Protection Agency
Washington, D.C. 20460

CATS Biweekly Reports
Nos. 40 - 52

Anon
ACRYLONITRILE
Chem. Eng. News 54 (6): 11 (February 1976)

Du Pont will add 100 million lb/year acrylonitrile capacity by expanding its Memphis and Beaumont, Texas facilities. New capacity is geared for the merchant market.

40-0002
ARSENIC

Anon
ASARCO DEAL WOULD KEEP TACOMA SMELTER RUNNING
Chem. Week 118 (5): 9 (4 February 1976)

Asarco may get a temporary variance from arsenic emission standards for its Tacoma, Washington copper smelter, providing it installs control systems and a $250,000 monitoring program that will cost another $150,000/year to operate. Asarco will be allowed to run its liquid sulfur dioxide and sulfuric plants, recovering a minimum of 47% of the sulfur instead of the 90% required eventually.

40-0003
ARSENIC

Bohn, Arne
ARSENIC IN MARINE ORGANISMS FROM WEST GREENLAND
Mar. Pollut. Bull. 6 (6): 87-9 (1975)

Dry weight arsenic levels of from 11.1 to 307 ppm in fish fillets, 7.6 to 512 ppm in fish livers, up to 80.2 ppm in prawns, and just 6.0 ppm in planktonic copepods were measured during a 1972-3 study of trace metal levels in marine organisms from a West Greenland inlet. Tolerance of such high levels indicates that in certain marine organisms arsenic is predominantly organically bound and is less toxic than inorganic arsenic.

Brown, Martha M. et al
INTRACELLULAR EFFECTS OF CHRONIC ARSENIC ADMINISTRATION ON RENAL PROXIMAL TUBULE CELLS
J. Toxicol. Environ. Health 1 (3): 505-14 (January 1976)

Rats were given 40, 85, or 125 ppm arsenic (as sodium arsenate) in deionized water for 6 weeks. Compared to controls, treated rats showed a decrease in water intake. The higher the arsenic intake the greater was the decrease in water consumption. Arsenic-fed rats also showed an increase in kidney weights in relation to body weights. Other kidney effects were decreased state 3 respiration and respiratory control ratios, noted at the 85 and 125 ppm levels. At all dose levels, proximal tubule cells showed swollen mitochondria and increased dense lysosome-like bodies. Apparently, chronic *in vivo* arsenic administration changes the normal ultrastructure and respiratory ability of rat proximal tubule cell mitochondria.

40-0005
ASBESTOS

Cunningham, H.M. et al
QUANTITATIVE RELATIONSHIP OF FECAL ASBESTOS TO ASBESTOS EXPOSURE
J. Toxicol. Environ. Health 1 (3): 377-9 (January 1976)

The described method of isolating chrysotile fibers from feces and counting them with an electron microscope was used on feces samples from subjects exposed to high and to moderate industrial levels of chrysotile asbestos. Those exposed to high levels of asbestos showed 4.03 to 92.99 x 10^6 fibers/gram in feces; those exposed to moderate levels, 0.51 to 33.50 x 10^6 fibers/gram. Feces of technicians used as controls contained only 0.00 to 1.70 x 10^6 fibers/gram.

40-0006
ASBESTOS

Ramos, Henry
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION REPORT 74-45-150, TRIMTEX DIVISION OF WILLIAM E. WRIGHT COMPANY, WILLIAMSPORT, PENNSYLVANIA
PB-246 487. NIOSH-TR-HHE-74-45-150 (October 1974)

A plant manufacturing a large variety of trimmings and braids was investigated by NIOSH in order to evaluate employee exposures to asbestos. Asbestos yarn was handled in the braiding and spooling rooms and airborne concentrations of asbestos were determined in these areas. On the basis of these environmental concentration measurements, employee interviews, and information available on the toxicity of asbestos dust, it was determined that asbestos dust concentrations found in the work environment at the time of the evaluation were not toxic.

[Abstract in: NTIS Government Abstracts, Medicine and Biology, pp. 84-5 (2 February 1976)]

Urwin, Colin et al
AN EVALUATION OF THE MUTAGENICITY OF THE CUTTING OIL PRESERVATIVE GROTAN BK
Mutat. Res. 40 (1): 43-6 (1976)

Benzidine, used as a positive control in this study, caused a marked increase in the incidence of micronucleated polychromatic erythrocytes, when applied to the skin of rats or administered to them via subcutaneous injection. The test compound, Grotan BK, a preserving agent used in industrial oils, showed no detectable mutagenic activity in the micronucleus test.

40-0008
FLUOROCARBONS

Cicerone, R.J. and Stedman, D.H.
ESTIMATE OF LATE 1974 STRATOSPHERIC CONCENTRATION OF GASEOUS CHLORINE COMPOUNDS (ClX)
Geophys. Res. Lett. 2 (6): 219-22 (1975)

The total concentration [ClX] versus altitude of Cl-containing molecules (particularly HCl, Cl, and ClO) now in the stratosphere from various sources was estimated and judged to be caused by photolysis near 30 km of man-made CF_2Cl_2 and $CFCl_3$, and CCl_4 from a ground-level source that is either man-made or natural. Stratospheric ClX contributions of CH_3Cl are discussed. More Cl atoms will be injected near 30 km from the CF_2Cl_2 and $CFCl_3$ released after the mid-1960's than from the (presumed) steady state CCl_4 and CH_3Cl. Keeping CF_2Cl_2 and $CFCl_3$ emissions at their 1973 levels would increase their tropospheric mixing ratios by about a factor of 10 and stratospheric ClX mixing ratios to about 4×10^{-9} in 50 to 100 years, the time when steady state is reached.

40-0009
FLUOROCARBONS

Schmeltekopf, A.L. et al
MEASUREMENTS OF STRATOSPHERIC $CFCl_3$, CF_2Cl_2, AND N_2O
Geophys. Res. Lett. 2 (9): 393-6 (1975)

Stratospheric air samples from 17.7, 22.3, and 26.2 km were analyzed for $CFCl_3$, CF_2Cl_2, and N_2O and their measured concentrations matched well with theoretical models. Because the dissociation products of these compounds catalytically destroy ozone in the stratosphere, it is necessary to determine their concentrations in the stratosphere in order to understand the ozone balance.

40-0010
FLUOROCARBONS

Stolarski, P.S. and Rundel, R.D.
FLUORINE PHOTOCHEMISTRY IN THE STRATOSPHERE
Geophys. Res. Lett. 2 (10): 443-4 (1975)

Knowledge of the photochemistry of fluorine in the stratosphere will help estimate the effect on ozone of fluorine atoms released by the breakdown of chlorofluoromethanes. This study indicates that fluorine is predominantly tied up as HF, thus causing a negligible amount of catalytic ozone destruction compared to that caused by chlorine.

40-0011
FLUOROCARBONS

Heidt, L.E. et al
STRATOSPHERIC PROFILES OF CCl_3F AND CCl_2F_2
Geophys. Res. Lett. 2 (10): 445-7 (1975)

Measurements of CCl_3F and CCl_2F_2 in stratospheric samples collected in 1973 through 1975 are compared to calculated predictions.

Rowland, F.S. and Molina, Mario J.
CHLOROFLUOROMETHANES IN THE ENVIRONMENT
Rev. Geophys. Space Phys. 13 (1): 1-35 (February 1975)

This review covers such topics as current inventories of atmospheric $CFCl_3$ and CF_2Cl_2, worldwide industrial production of chlorofluoromethanes, atmospheric residence time for $CFCl_3$, atmospheric diffusion models, summary of ozone depletion effects, current stratospheric levels of ClX, possible biological and climatological effects of stratospheric ozone depletion, observable trends in the average ozone concentration of the atmosphere, and several other related topics.

Anon
BRITISH SEE NO NEED TO RUSH IN WITH FLUOROCARBON RESTRICTIONS
Chem. Week 118 (6): 43 (11 February 1976)

Although British researchers report that fluorocarbons may cause a 10% depletion of the ozone layer by the year 2000, Britain believes it can allow 10 years before restricting manufacture of some fluorocarbons. An extensive study now underway, expected to be completed in 1978, should provide more definitive results. Some 70,000 tons of F-11 and F-12 were produced in the U.K. in 1975.

40-0014
FLUOROCARBONS

Anon
DOW SUGGESTS ADDING METHYLENE CHLORIDE TO AID CO_2, HYDROCARBON AEROSOL SYSTEMS
Household and Pers. Prod. Ind. 13 (1): 70, 80 (1976)

As alternatives to fluorocarbon aerosols, CO_2 or hydrocarbons are potential propellants, but each has drawbacks, e.g., flammability in the case of hydrocarbons. Now, Dow Chemical Co. suggests that methylene chloride added to CO_2 or hydrocarbons will help overcome their disadvantages. Methylene chloride, however, may pose certain stratospheric and environmental effects of its own.

FLUOROCARBONS

See also: 40-0018, Polyurethanes

Elkort, R.J. et al
PRENEOPLASTIC CHANGES IN RABBIT PANCREATIC DUCT CELLS PRODUCED BY DIMETHYLHYDRAZINE
Int. J. Cancer 16 (5): 810-8 (15 November 1975)

Silicone polycarbonate catheters containing 40% dimethylhydrazine (DMH) were implanted into the main pancreatic duct of rabbits. The DMH was released into the pancreatic juice for 4 to 10 days and the histopathologic changes were studied over an 80 week period. These changes included pancreatic ductal cell hyperplasia, metaplasia and dysplasia with periductal cell infiltration, and adenoma formation. Pathologic progression reached a maximum in 12 to 32 weeks and then slowed down.

Chrostek, Walter J. and Cormer, John W.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION REPORT 74-42-168, TRONIC INDUSTRIES, INC., HARRISBURG, PA.
PB-246 486. NIOSH-TR-HHE-74-42-168 (January 1975)

A health hazard evaluation was conducted in the polyurethane foam molding department of a plant producing plugs for artillery shells. Concentrations of toluene 2,4-diisocyanate exceeding both the NIOSH recommended standard and the existing OSHA, Department of Labor standard, were found at the mold clamping station. It was determined that employee exposure to toluene 2,4-diisocyanate is potentially toxic to employees at the mold clamping station.

[Abstract in: Government Abstracts, Medicine and Biology, p. 84 (2 February 1976)]

Sanborn, James R. et al
PLASTICIZERS IN THE ENVIRONMENT: THE FATE OF DI-N-OCTYL PHTHALATE (DOP) IN TWO MODEL ECOSYSTEMS AND UPTAKE AND METABOLISM OF DOP BY AQUATIC ORGANISMS
Arch. Environ. Contam. Toxicol. 3 (2): 244-55 (1975)

The distribution of di-n-octyl phthalate (DOP) and its metabolites in various organisms and water was studied in a 33-day terrestrial-aquatic model ecosystem and in a 3-day aquatic ecosystem. In the 33-day system, algae contained 1.80 ppm of DOP, and *Daphnia* on the other end contained only 0.16 ppm with fish, snail, and mosquito in between the two limits. In the 3-day system, *Daphnia* contained the most DOP, 32.52 ppm, and the mosquito was next highest at 18.3 ppm, while algae contained 2.28 ppm and fish only 0.004 ppm. The higher residues in the 3-day system indicate a possible degradation of DOP by the 30th day. Data indicate a half-life of 5 days for the degradation of DOP in water.

Anon
FOAM PLASTIC IN AN AEROSOL
Aerosol Age 21 (1): 22-4, 41 (1976)

Soon to be marketed in the U.S. is a prepolymerized, single-component polyurethane foam that comes in an aerosol can. Three formulations exist: Fomosoft, which extrudes as a pliable bead of foam; Fomofill, a formulation that expands to look like commercial foam plastic blocks; and Fomospray, which is a low viscosity spray used for thermal and acoustic insulation. Physical properties of the 3 formulations are tabulated. The products use fluorocarbons as blowing agents but, apparently, the fluorocarbons do not escape to the atmosphere.

Withey, Jim R.
PHARMACODYNAMICS AND UPTAKE OF VINYL CHLORIDE MONOMER ADMINISTERED BY VARIOUS ROUTES TO RATS
J. Toxicol. Environ. Health 1 (3): 381-94 (January 1976)

To determine the potential hazard of vinyl chloride monomer when ingested orally, rats were given up to 2.0 mg/ml VC in aqueous solution by intragastric intubation. According to time-concentration curves resulting from sequential blood samples, the uptake of VC was very rapid, reaching peak concentrations in 10 minutes. A rapid uptake was also noted following iv injection of VCM in vegetable oil and in gas-phase studies, when rats were exposed to up to 7,000 ppm of VC. Kinetic coefficients for the distribution and elimination rates of VC from the blood compartment were determined.

40-0020
VINYL CHLORIDE

Krishen, Anoop and Tucker, Ralph G.
ELIMINATION OF INTERFERENCE OF ACETALDEHYDE IN GAS CHROMATOGRAPHIC QUANTITATION OF LOW LEVELS OF VINYLCHLORIDE
Anal. Chem. 48 (2): 455-6 (1976)

Complying with OSHA standards for low atmospheric levels of vinyl chloride has emphasized the need for sampling and analytical methods that can detect less than 1 ppm VCM in various atmospheres and materials. The described technique makes it possible to eliminate interference caused by the presence of acetaldehyde.

See: 40-0016, Isocyanates

40-0021
VINYL CHLORIDE

Anon
HAZARD TO UNBORN
Chem. Week 118 (6): 23 (11 February 1976)

A NIOSH study of 62 families discussed at recent EPA hearings on proposed standards to cut VCM emissions indicates that wives of men exposed to VCM at work were more apt to have miscarriages or stillbirths than pregnant women whose husbands were not exposed to VCM. Apparently, VCM is potentially hazardous to the husbands' sperm cells.

40-0022
VINYL CHLORIDE

Butler, George J. and Bodner, Arnold H.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION REPORT 74-29-161, ETHYL VISQUEEN DIVISION OF ETHYL CORP., TERRE HAUTE, INDIANA.
PB-246 482. NIOSH-TR-HHE-74-29-161 (November 1974)

A manufacturer of polyvinyl chloride pipe was investigated by NIOSH to evaluate worker exposure to polyvinyl chloride. Crystals of polyvinyl chloride resin are mixed with other materials and then extruded into pipe. Air samples were collected, workers were given medical interviews, and blood samples were taken to be analyzed for serum glutamic-oxaloacetic transaminase. It was determined that a health hazard from vinyl chloride monomer did not exist at the time of the survey but that a potential carcinogenic hazard did exist in the blending room areas of the plant.

[Abstract in: NTIS Government Abstracts, Medicine and Biology, p. 84
(2 February 1976)]

40-0023
VINYL CHLORIDE

Butler, George J.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION REPORT 74-149-180, PROTECTO WRAP COMPANY, DENVER, COLORADO
PB-246 496. NIOSH-TR-HHE-74-149-180 (April 1975)

The environmental survey of a plant manufacturing a polyvinyl chloride backed material by NIOSH investigators revealed potentially hazardous levels of vinyl chloride gas. It was recommended that airborne concentrations of vinyl chloride be reduced to non-detectable levels and that respirators be worn by exposed employees until control measures are effective.

[Abstract in: NTIS Government Abstracts, Medicine and Biology, p. 86 (2 February 1976)]

40-0024
VINYL CHLORIDE

Butler, George J.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION REPORT 74-151-181, WESTERN FORGE CORPORATION, COLORADO SPRINGS, COLORADO
PB-246 497. NIOSH-TR-HHE-74-151-181 (April 1975)

NIOSH conducted an environmental survey of a forge manufacturing hand tools. Employees were exposed to vinyl chloride gas in the assembly and packing area arising from the vinyl chloride coating applied to packing containers. It was determined that employees were exposed to potentially toxic levels of vinyl chloride at the time of this evaluation. Recommendations were made regarding reduction of airborne concentrations and the use of respiratory protective equipment.

[Abstract in: NTIS Government Abstracts, Medicine and Biology, p. 86 (2 February 1976)]

40-0025
VINYL CHLORIDE

NIOSH
RECOMMENDED STANDARD FOR OCCUPATIONAL EXPOSURE TO VINYL CHLORIDE
PB-246 691 (1975)

The report includes: Background (events and toxicological finds) of the standard; scope and application; definitions of terms; requirements for regulated areas; routine operations; reactor and vessel entry; maintenance and decontamination; hygiene measures; signs; information and training; environmental monitoring and record keeping; reports; medical surveillance. Despite the fact that animal experiments have shown no liver tumors at atmospheric concentrations of 50 ppm, the concept of an allowable working level is rejected. Since there is measurable concentrations of vinyl chloride personnel should wear an air-supplied respirator because chemical cartridge respirators do not afford adequate protection against vinyl chloride.

[Abstract in: NTIS Govt. Abstracts, Med. and Biol., p.86 (Feb. 2, 1976)]

40-0026
VINYL CHLORIDE

Anon
THE B.F. GOODRICH CO. (Akron, Ohio) ANNOUNCED THAT THE LARGEST R & D PROGRAM IN ITS HISTORY. . .
Environ. Sci. Technol. 10 (2): 117 (1976)

B.F. Goodrich is not only continuing to produce PVC but is actually expanding its production capacity as the result of research prompted by new and anticipated federal regulations on VCM. The company's "Clean Reactor" system has drastically cut VCM levels. Goodrich's PVC is now extremely low in entrapped VCM.

Otto, K. and Montreuil, C.N.
INFLUENCE OF TETRAETHYLLEAD AND LEAD SCAVENGERS ON OXIDATION OF CARBON MONOXIDE AND HYDROCARBONS OVER Pt AND Pd
Environ. Sci. Technol. 10 (2): 154-8 (1976)

This study was conducted to determine the effects of TEL, alone, or in combination with the halide compounds, ethylene dibromide (EDB) and ethylene dichloride (EDC) on the catalyst deterioration in the catalytic converters now used in autos to remove air pollutants. Catalyst activity is decreased by EDB but not by EDC. Interaction of TEL, EDB, and EDC yields various lead compounds, principally lead bromochloride. Combustion of an EDB-containing fuel yields a gaseous Br species that occupies adsorption sites needed for oxidation of HC and CO. The oxidation of HC and CO is poisoned by EDB combustion products (HBr or bromine) but this poisoning is reversible when Br is eliminated.

40-0028
NITROSAMINES

Shabad, L.M. et al
THE EFFECT PRODUCED BY SOME CARCINOGENIC NITROSOCOMPOUNDS ON ORGAN CULTURES FROM HUMAN EMBRYONIC LUNG AND KIDNEY TISSUES
Int. J. Cancer 16 (5): 768-78 (15 November 1975)

Organ cultures of human embryonic lung and kidney tissues were used to study the actions of the carcinogenic nitrosocompounds -- N-nitrosomethylurea, dimethylnitrosamine, and orthoaminoazotoluene. The carcinogens induced epithelial hyperplasia, but effects in lung tissues were different from those in kidney tissues. Morphological changes were greater with higher doses. Treated organ cultures survived longer than did the controls.

40-0029
NITROSAMINES

Tyndall, R.L. et al
EARLY ALTERATIONS IN PLASMA ESTERASES WITH ASSOCIATED PATHOLOGY FOLLOWING ORAL ADMINISTRATION OF DIETHYLNITROSAMINE AND BUTYLATED HYDROXYTOLUENE SINGLY OR IN COMBINATION
Int. J. Cancer 16 (1): 184-91 (15 July 1975)

Mice treated with diethylnitrosamine (DENA) showed an altered plasma esterase pattern. Those treated with DENA in combination with butylated hydroxytoluene (BHT) showed changes indicative of their combined effects. Stomach and lung tumors were found in mice fed DENA alone or combined with BHT, but no tumors were found in the control animals. DENA had a more severe effect on female than on male mice. Changes induced by DENA also affected testosterone-related esterases, suggesting an endocrine involvement in DENA carcinogenesis.

40-0030
NITROSAMINES

Arcos, Joseph C. et al
DIMETHYLNITROSAMINE-DEMETHYLASE: MOLECULAR SIZE-DEPENDENCE OF REPRESSION BY POLYNUCLEAR HYDROCARBONS. NONHYDROCARBON REPRESSORS
J. Toxicol. Environ. Health 1 (3): 395-408 (January 1976)

Molecular-size dependence of repression of hepatic DMN-demethylase by polynuclear hydrocarbons is discussed as is the effect of compounds other than hydrocarbons on hepatic DMN-demethylase level.

40-0031
NITROSAMINES

Anon
KNOCK NITRITE LEVELS
Chem. Week 118 (6): 21 (11 February 1976)

Environmental and consumer groups claim that the USDA's proposed limits of nitrites and nitrates in foods are not low enough to insure protecting the public from the potential dangers of nitrosamines, which are reportedly carcinogenic in rats.

Scherer, E. et al
THE EFFECT OF ANTILYMPHOCYTIC AND NORMAL HORSE SERUM ON GROWTH OF PRECANCEROUS FOCI AND DEVELOPMENT OF TUMOURS INDUCED BY DIETHYLNITROSAMINE IN RAT LIVER
Eur. J. Cancer 12 (1): 25-31 (1976)

Partially hepatectomized rats were treated with a single subcarcinogenic dose (10 mg/kg) of diethylnitrosamine (DENA), then given 2 ml of horse anti-rat antilymphocytic serum (ALS) once a week for 6 weeks (procedure A). Other rats received a carcinogenic dose (8 mg/kg day) of DENA along with 2 ml ALS once a week for 6 weeks (procedure B). Precancerous foci (ATPase-deficient islands) did not differ significantly in number and size from those of controls that had received pre-immune horse serum (HS) or no serum.

Three weeks later, procedure A rats were given daily doses of DENA until liver tumors caused them to die. The prior ALS treatment apparently did not affect the death rate. The ALS group of procedure B rats, when given no further treatment, showed a much higher rate of death from liver tumors than did control groups.

40-0033
GENERAL INFORMATION

Bauchinger, M. et al
CHROMOSOME ABERRATIONS IN LYMPHOCYTES AFTER OCCUPATIONAL EXPOSURE TO LEAD AND CADMIUM
Mutat. Res. 40 (1): 57-61 (1976)

Structural chromosome aberrations found in peripheral lymphocytes of 24 zinc smelting plant workers, who had been exposed to zinc, lead, and cadmium fumes or dust could probably be due to cadmium, although the possible synergistic effect of several metal compounds must be considered.

40-0034
GENERAL INFORMATION

Biesinger, Kenneth E. et al
COMPARATIVE TOXICITY OF POLYELECTROLYTES TO SELECTED AQUATIC ANIMALS
J. Water Pollut. Control Fed. 48 (1): 183-7 (1976)

The increasing use of polyelectrolytes to control solids in potable water and municipal wastewater coupled with their wide use in many industries (food processing, textile, pulp and paper, fiber glass, glass and ceramic, paint, mining, metal and metal finishing, and petroleum) prompted this study of the acute toxicity of several cationic polyelectrolytes (Superfloc 330, Calgon M-500, Gendriv 162, Magnifloc 570C, and Magnifloc 521C), an anionic polyelectrolyte (Dow AP-30), and a nonionic polyelectrolyte (Magnifloc 905N) to various aquatic animals. Toxic effects noted in static acute bioassays and dynamic acute bioassays indicate the need for further testing and suggest that only the amounts needed for effective flocculation should be used. Superfloc 330 and Calgon M-500 significantly impaired reproduction in *Daphnia*.

40-0035
GENERAL INFORMATION

Milvy, Paul and Garro, Anthony J.
MUTAGENIC ACTIVITY OF STYRENE OXIDE (1,2-EPOXYETHYLBENZENE), A PRESUMED STYRENE METABOLITE
Mutat. Res. 40 (1): 15-18 (1976)

Styrene oxide (1,2-epoxyethylbenzene), presumably the first metabolic derivative of styrene (vinyl benzene), is shown to be mutagenic for *Salmonella typhimurium*. Unlike vinyl chloride which is mutagenic per se for *Salmonella typhimurium*, styrene was not found to be mutagenic. Styrene vapor is rapidly metabolized upon inhalation, thus carrying the potential of a carcinogenic hazard for workers exposed to it. Approximately 1 million tons/year of styrene are used in the U.S. in the manufacture of plastics and synthetic resins or as an organic solvent.

40-0036
GENERAL INFORMATION

Kirkland, D.J. and Venitt, S.
CYTOTOXICITY OF HAIR COLOURANT CONSTITUENTS: CHROMOSOME DAMAGE INDUCED BY TWO NITROPHENYLENEDIAMINES IN CULTURED CHINESE HAMSTER CELLS
Mutat. Res. 40 (1): 47-56 (1976)

Hairdressers/beauticians and workers in cosmetic manufacturing plants may be exposed to potential carcinogens, according to this study. The aromatic amines, 2-nitro-p-phenylenediamine and 4-nitro-o-phenylenediamine, in the dose-range of 5-100 μg/ml, were shown to be cytotoxic to cultured Chinese hamster cells, exposed to the compounds continuously for 5 days. Both compounds are used as dyes in many hair colorants.

40-0037
GENERAL INFORMATION

Anon
CONFIRMED: AGRICULTURAL PLANTS TRANSFORM MERCURY INTO METHYLMERCURY
Chem. Week 118 (5): 31 (4 February 1976)

Reported findings by EPA researchers that inorganic mercury in common agricultural plants and soils can be converted in the presence of oxygen to the more toxic methylmercury suggests a potential environmental problem from the greater use of coal as a fuel, which could result in more mercury being emitted into the atmosphere yearly. No new controls on mercury are recommended, however, since an unexplained mechanism seems to prevent accumulation of quantities of methylmercury.

40-0038
GENERAL INFORMATION

Anon
THE RISING CLAMOR ABOUT PCB's
Environ. Sci. Technol. 10 (2): 122-3 (1976)

At the recent National Conference on Polychlorinated Biphenyls (PCB's), various speakers discussed the toxic and genetic effects of these industrially useful compounds which argue for their being phased out in the U.S. Possible alternatives mentioned were Exxon's diisononyl phthalate (ENJ-2065); butylated monochlorodiphenyl oxide; and a mixture of pure dichlorobiphenyls and chloralkylene, an alkylated derivative in 20:80 proportion.

Anon
LAST YEAR'S FEATS ARE NEXT YEAR'S PERIL
Chem. Week 118 (7): 15-17 (18 February 1976)

Chemical industry exports in 1975 were just above 10% of chemical plant output but shipments from January through November 1975 were just 3% under the high rate of 1974.

Exports of acrylonitrile amounted to about 198 million pounds, up 28.3% from 1974; exports of vinyl chloride were about 414.6 million lb, up 0.5% from 1974; PVC exports were 175.7 million lb, down 44.6% from 1974; exports of toluene diisocyanates reached about 113 million lb, up 13.3% from 1974; and those of titanium dioxide were about 31.4 million lb, down 48.4% from 1974.

Almost 37.5 million lb of perchlorethylene were imported in 1975, an increase of 58.7% over 1974. About 53 million lb of titanium dioxide were imported, a decrease of 24.3% under 1974; while about 19.8 million lb of antimony oxide were imported, an increase of 58.1% over 1974.

41-0002
ARSENIC

Datta, D.V.
ARSENIC AND NON-CIRRHOTIC PORTAL HYPERTENSION (Letter to Editor)
Lancet 1 (7956): 433 (21 February 1976)

Referring to two reports [Morris, J.S. et al, Gastroenterology 66: 86 (1974) and Viallet, A. et al, ibid 62: 177 (1972)] on noncirrhotic portal hypertension (N.C.P.H.) caused by chronic arsenic intake in 9 patients, 5 of whom showed a high arsenic content of liver, the author tabulates the level of arsenic measured in the tissues (liver, kidney, aorta, brain, intestine, portal vein, and heart) of a deceased N.C.P.H. patient in India, who had all his life consumed arsenic-contaminated water (>50 μg/dl). The measured arsenic levels were higher than those of a control. The author suggests that the drinking of arsenic-contaminated water may be a contributing factor to such common Indian diseases as cirrhosis, non-cirrhotic portal fibrosis, and extrahepatic portal vein obstruction.

41-0003
ARSENIC

Anon
KEPONE CLAIMS CLIMB
Chem. Week 118 (9): 16 (3 March 1976)

Former employees and their families are still filing suits for damages from Kepone effects against Life Science Products of Hopewell, Va., the now defunct manufacturer of the chlorinated insecticide. Three new suits amounting to $83 million were filed recently. These suits are in addition to previously filed suits of more than $32 million.

Arsenic is now involved in another incident in Virginia, the Alexandria, Va., health board having found 656 to 27,700 ppm of arsenic in soil at R.H. Bogle, a herbicide distributor. These high levels (a lethal dose of arsenic is 60-180 mg by inhalation or ingestion) found at depths of up to 7 ft on a small plot of land have prompted the Virginia Water Control Board to advise the company to institute action to prevent contaminated runoff from entering an inlet and the Potomac River. Bogle stopped using arsenic 8-10 years ago and had treated the surface to prevent dust rising.

41-0004
ASBESTOS

Enterline, Philip E.
ESTIMATING HEALTH RISKS IN STUDIES OF THE HEALTH EFFECTS OF ASBESTOS
Am. Rev. Respir. Dis. 113 (2): 175-80 (1976)

Twelve studies published from 1958 through 1972 on the relative risks for respiratory cancer observed in miners, insulators, and workers in the manufacturing industry establish the relative risk at from 1.2 to 9.2. Factors contributing to this range, including studies in which the level and duration of exposure were not known, are reviewed as problems that should be taken into consideration to insure improved future epidemiologic studies.

41-0005
ASBESTOS

Wehner, A.P. et al
CHRONIC INHALATION OF ASBESTOS AND CIGARETTE SMOKE BY HAMSTERS
Environ. Res. 10 (3): 368-83 (December 1975)

Syrian golden hamsters were exposed to respirable aerosols of chrysotile asbestos at a mean concentration of 23 μg/l for 7 hr/day, 5 days/week. Fifty percent (51 hamsters) also inhaled cigarette smoke for 10 minutes, 3 times/day, 5 days/week, while the other 51 were exposed to sham-smoke. Fifty-one control hamsters were exposed to smoke, while another 51 were exposed to sham dust. Other studies were conducted on hamsters exposed to smoke and to cobalt oxide (CoO), nickel oxide (NiO), diethylnitrosamine (DEN), which was injected subcutaneously. Asbestos-exposed animals developed more severe lung lesions earlier than the other treated animals. Death occurred earlier in the asbestos-treated groups and death rates were higher. Death was attributed to asbestosis caused by an aerosol concentration considered too high for chronic inhalation experiments. No carcinogenic effects of asbestos or cocarcinogenic effects of cigarette smoke were noted.

Kogan, F.M. et al
CANCER MORTALITY RATE AMONG WORKERS IN THE ASBESTOS INDUSTRY OF THE URALS
PB-239 983 [English translation of Gigiena i Sanitariya (USSR) 37 (7): 29-32 (1972)]

Based on a twenty year study of the mortality rate of workers in the mining of asbestos, it was found that the death rate was higher than among the rest of the population with reference to cancer of the lungs, stomach, intestines and cervix. A higher incidence of cancer was noted in the age group over 50; the mortality of women working with asbestos was found to be lower than the men in these areas, but considerably higher than among the female population. It is believed that a program of medical awareness should be instituted in work areas where people are employed in the mining, processing and use of asbestos, and that the achievement of low levels of dust in these areas would be a major factor in the lowering of cancer incidence of industrial workers.

[Abstract in: Government Reports Announcements 75 (11): 43 (30 May 1975)]

Corbett, T.H. et al
TOXICITY OF POLYBROMINATED BIPHENYLS (FIREMASTER BP-6) IN RODENTS
Environ. Res. 10 (3): 390-6 (December 1975)

Because of the toxic effects on cattle inadvertently given feed contaminated with a polybrominated biphenyl flame retardant, identified as Firemaster BP-6, the toxic effects of this product were studied in rodents.

Timed-pregnant mice (sperm day - Day 0) were exposed to 50, 100, or 1,000 ppm of Firemaster BP-6 in rodent chow from Days 7-18 of their pregnancy, while rats were exposed from Days 7-20 of their pregnancy. Post-mortem examination showed that both rodent types experienced a decreasing mean fetal weight with increasing dosage and that the mice also developed exencephaly at the two higher dosages and cleft palate and hydronephrosis at the 1,000 ppm dosage level. Nonpregnant mice used as controls showed an increase in liver size and weight from the 1,000 ppm dosage.

41-0008
BROMINATED BIPHENYLS

Sundström, G. et al
IDENTIFICATION OF 2,2',4,4',5,5'-HEXABROMOBIPHENYL AS THE MAJOR COMPONENT OF FLAME RETARDANT FireMaster BP-6
Chemosphere 5 (1): 11-4 (1976)

The accidental addition of a mixture of polybrominated biphenyls to livestock feed in Michigan several years ago poisoned many cattle, pigs and chicken. Involved in that incident was the flame retardant, Firemaster BP-6, manufactured by Michigan Chemical Co.

A gas chromatogram of this product showed its major component to be 2,2',4,4',5,5'-hexabromobiphenyl.

See also: 41-0010, Flame Retardants

Nicoloff, H. and Gecheff, K.
METHODS OF SCORING INDUCED CHROMOSOME STRUCTURAL CHANGES IN BARLEY
Mutat. Res. 34 (2): 233-44 (1976)

Barley was treated with gamma-rays and with ethyleneimine and chromosome aberrations induced were analyzed by anaphase and metaphase scoring in order to compare the two scoring methods.

Hutzinger, O. et al
ENVIRONMENTAL CHEMISTRY OF FLAME RETARDANTS. PART I. INTRODUCTION AND PRINCIPLES
Chemosphere 5 (1): 3-10 (1976)

Because (1) some 20,000 to 40,000 tons of flame retardants may be used in clothing and home furnishings by 1980, many flame retardants have chemical structures akin to those of known persistent organic pollutants or insecticides, (3) there is a possibility that flame retardants leached from fibers during laundering will be released into sewage, and (4) some components of flame retardants may be toxic, this paper considers the information that should be obtained to understand the environmental chemistry of flame retardants. Flame retardants are classified as reactive or additive types, and representative chemical structures (e.g., polybromobiphenyls) are given. Physically blended flame retardant compounds are more apt to leach from finished polymer products. Properties, composition, environmental behavior, and metabolism of representative molecules will be presented in later papers.

FLAME RETARDANTS

See: 41-0007, Brominated Biphenyls

41-0008, Brominated Biphenyls

Chameides, William L. and Walker, James C.G.
STRATOSPHERIC OZONE: THE POSSIBLE EFFECTS OF TROPOSPHERIC-STRATOSPHERIC FEEDBACK
Science 190 (4221): 1294-5 (26 December 1975)

In predicting the effects on ozone of fluorocarbons and nitrogen oxides released to the atmosphere, previous models have assumed a constant tropospheric mixing ratio of such long-lived gases as CH_4, CH_3Cl, and NO_x. The possibility of a tropospheric-stratospheric feedback, which involves variations in tropospheric OH and result in almost 100% recovery in atmospheric ozone, is discussed. It is recommended that tropospheric-stratospheric feedback should be taken into account in future stratospheric calculations involving CH_4 and CH_3Cl.

Norström, Åke et al
FORMATION OF CHLORODIBENZOFURANS BY IRRADIATION OF CHLORINATED DIPHENYL ETHERS
Chemosphere 5 (1): 21-4 (1976)

In what they claim is the first study of the photochemical breakdown of polychlorinated diphenyl ethers (found as impurities in chlorophenols used widely as fungicides and herbicides), the authors report that these ethers can follow two competitive pathways, dechlorination and ring closure, to form more highly toxic chlorinated dibenzofurans. As an environmental precaution, they recommend minimizing the level of chlorinated diphenyl ethers in chlorophenols.

Iatropoulos, M.J. et al
ABSORPTION, TRANSPORT AND ORGANOTROPISM OF DICHLOROBIPHENYL (DCB), DIELDRIN, AND HEXACHLOROBENZENE (HCB) IN RATS
Environ. Res. 10 (3): 384-9 (December 1975)

Because the title chlorinated organics have commercial uses that introduce them into the atmosphere, a study was made of their comparative modes of gastrointestinal absorption, transport, and selective organotropism in the rat.

Rats, given a single dose of 150 µg of ^{14}C-labeled dichlorobiphenyl (DCB), dieldrin, and hexachlorobenze (HCB) by stomach tube, were killed for examination at 1, 3, 5, 12, and 48 hours. HCB, absorbed more slowly after one hour than the other two compounds by the walls of the stomach and the duodenum, reached the jejunum and the ileum after 3 hours. Very little HCB was found in the liver, most of it being absorbed by the lymphatic system.

41-0014
HYDRAZINE

Hunter, Byron A.
CHEMICAL BLOWING AGENTS
Rubber Age 108 (2): 19-25 (1976)

Sulfonyl hydrazides are one class of commercially important blowing agents whose chemistry is reviewed in this article. Benzene sulfonyl hydrazide, prepared from reacting benzene sulfonyl chloride with hydrazine in the presence of ammonia or a similar base, decomposes to diphenyl sulfide. Another compound, p-toluene sulfonyl hydrazide, which melts and decomposes at 120°C or higher compared to 105°C for benzene sulfonyl hydrazide, decomposes mainly to ditolyl disulfide, p-tolyl p-toluene thiosulfonate, and also to p-toluene sulfinic acid and to hydrazine. In the sulfonyl semicarbazide class, p-toluene sulfonyl semicarbazide is a new blowing agent available from Uniroyal. The sulfonyl semicarbazides generate much carbon dioxide and nitrogen when they decompose, plus non-gaseous products that differ from the parent compound.

41-0015
HYDRAZINE

Anon
OLIN WILL TRIPLE OUTPUT OF HYDRAZINE TO MEET NEEDS
Chem. Week 118 (7): 11 (18 February 1976)

Expected to be on-stream in 1978, Olin's new $25 million plus plant, which will be built next to an existing hydrazine unit at Lake Charles, La., will add over 20 million lb/yr to the company's hydrazine hydrate capacity, more than tripling present capacity. The world need for 15-17%/yr more hydrazine has been predicted.

Misra, Hara P. and Fridovich, Irwin
THE OXIDATION OF PHENYLHYDRAZINE: SUPEROXIDE AND MECHANISM
Biochemistry 15 (3): 681-7 (10 February 1976)

In this study of the mechanism of oxidation of phenylhydrazine, a tentative mechanism is proposed for the reactions of possible intermediates, such as phenyldiazene and benzenediazonium ion. These data indicate that the biological effects of phenylhydrazine may be due to these intermediates and their reactivities.

41-0017
ISOCYANATES

Anon
DDM EXPOSURE CITED AS HEPATITIS THREAT
Chem. Eng. News 54 (7): 8 (16 February 1976)

4,4'-Diaminodiphenylmethane (DDM), an intermediate used primarily in making the isocyanate used to make polyurethane foam, is suspect as a potential cause of toxic hepatitis in over 300 workers. NIOSH, in publishing an alert on DDM, reports several studies that indicate such an effect. Additionally, some reports indicate that DDM may be a potential carcinogen, but no reported studies have substantiated this claim. An estimated 2500 workers are exposed to DDM, which is produced at the rate of over 200 million lb/yr in the U.S. Eight chemical companies make DDM. Of these, the three largest -- Allied Chemical, Dow Chemical, and Uniroyal -- report no cases of liver damage among their employees.

41-0018
ISOCYANATES

Anon
POLYURETHANES SET TO RIDE HIGH
Chem. Week 118 (9): 33-4 (3 March 1976)

Although U.S. consumption of all plastics in 1975 was 20% under that of 1974, polyurethane consumption dropped less than 5% from the 1.37 billion lb used in 1974.

Isocyanates fared less well in 1975, but predictions for strong growth for polyurethanes into the 1980's augers well for improved markets for isocyanates. Suppliers of polyurethane raw materials include Mobay, the biggest producer of isocyanates including toluene diisocyanate (TDI) and methane diisocyanate (MDI); Allied, a producer of TDI; BASF Wyandotte, Du Pont, and Olin, who supply TDI and other raw materials but not MDI; and Rubin, who offers both TDI and MDI. Dow will enter the isocyanate market in the second quarter of 1976, when it starts up its new 100 million lb/yr TDI plant in Freeport, Texas. Additional capacity will be available also from Mobay and BASF Wyandotte. Markets for raw materials and finished products are discussed.

See: 41-0001, Acrylonitrile

Anon
ERDA PUSHES FOR SYNTHETIC FUELS PROGRAM
Chem. Eng. News 54 (7): 16, 18 (16 February 1976)

Brief review of ERDA's plans shows optimism for passage by Congress of loan guarantee bill that will push start of ERDA's synthetic fuels commercialization program. Although Senate bill S. 2869 does not include provisions for support of shale oil programs, ERDA claims that such programs are part of its commercialization plan.

Anon
NON-MOCA URETHANES
Rubber Age 108 (2): 51 (1976)

Moca-free urethane elastomers having Shore A Durometers from 20 to 90 are new products of Urethane Research Laboratories, Anchor Adhesives Corp., Bronx, N.Y. Mixed in a two to one ratio, these two part systems are said to be very suitable for flexible process tools, encapsulating, making flexible molds and other uses.

Somers, G. Fred
THE ROLE OF PLANT RESIDUES IN THE RETENTION OF CADMIUM IN ECOSYSTEMS
PB-247 556. Delaware Univ., Newark. Dept. of Biological Sciences (September 1975)

Both fresh and partially decomposed residues of plant material from an old field, a deciduous hardwood forest and from under pine trees exhibited a high affinity for Cd++. The samples were dried and the degree of adsorption of Cd++ was assayed using 109Cd. Using the theory of multiple equilibria (Klotz, 1953) the total number of Cd-binding sites (n) and the intrinsic association constant (K) were determined. These appeared to fall into two classes with lower values for n and higher ones for K at concentrations of less than .0003 M Cd++ and the converse being true at higher concentrations of Cd++. Changes in the magnitude of n with litter decomposition appeared to be associated to some degree with changes in 'cellulose' and 'lignin' content. The total quantity of exchange sites corresponded to from 0.016 to 0.331 moles Cd/sq meter depending upon source of litter and degree of decomposition.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.95 (9 February 1976)]

See: 41-0001, Acrylonitrile

See: 41-0017, Isocyanates

See: 41-0018, Isocyanates

See: 41-0020, 4,4'-Methylenebis (2-chloroaniline)

Sweet, Diana M. and Moseley, B.E.B.
THE RESISTANCE OF *MICROCOCCUS RADIODURANS* TO KILLING AND MUTATION BY AGENTS WHICH DAMAGE DNA
Mutat. Res. 34 (2): 175-86 (1976)

Comparison of the resistance of *Micrococcus radiodurans* with that of *Escherichia coli* B/r to the lethal and mutagenic effects of ultraviolet light, ionizing radiation, mitomycin C, nitrous acid, ethylmethanesulfonate, hydroxylamine, β-propiolactone, and N-methyl-N'-nitro-N-nitrosoguanidine (NG) was studied. Like *E. coli* B/r, *M. radiodurans* was sensitive to trimethoprim resistance by NG, but it was more resistant than *E. coli* B/r, being only slightly sensitive to mutation by nitrous acid, ethylmethane sulfcnate, and β-propiolactone and non-mutable by the other mutagens tested. Apparently, the mutagenic pathway for the mutagens tested shown by *E. coli* B/r is missing in *M. radiodurans*.

Anon
RESEARCH PROJECT TO STUDY HEALTH ASPECTS OF TRICHLOROETHYLENE
J. Coat. Technol. 48 (12): 36 (January 1976)

BIO-TEST Laboratories will undertake for MCA a $400,000 plus research program to test the long-term inhalation effects of trichloroethylene on mice and rats.

See: 41-0019, Liquefaction and Gasification of Coal

41-0024
VINYL CHLORIDE

Bartsch, H. and Montesano, R.
MUTAGENIC AND CARCINOGENIC EFFECTS OF VINYL CHLORIDE
Mutat. Res. 32 (2): 93-114 (1975)

This review, containing 100 references, covers neoplastic and non-neoplastic diseases in man, various aspects of the mutagenicity of vinyl chloride, and its metabolism. About 50 cases of angiosarcomas of the liver connected with VCM or PVC have been tabulated in the United States and other countries. The data reviewed indicate that VCM is toxic, mutagenic, and carcinogenic in both animals and man.

41-0025
VINYL CHLORIDE

Anon
POLYVINYL CHLORIDE
Chem. Eng. News 54 (9): 9 (1 March 1976)

A $650,000 expansion of dispersion resins capacity at its Niagara Falls, N.Y. plant, announced by Goodyear, will give the company over half of the capacity it lost last year when it shut down operations following issuance of new vinyl chloride exposure standards by the government.

41-0026
VINYL CHLORIDE

Anon
REDUCES VCM CONTENT
Rubber Age 108 (2): 55 (1976)

Improvements made at its Flemington and Burlington, N.J. plants plus $50 million capital commitment for new Pasadena, Texas plant are credited by Tenneco Chemicals, Inc. for ability to offer PVC resins containing 98% less residual vinyl chloride than previously.

41-0027
VINYL CHLORIDE

MacBride, Roland R.
TOTTING UP THE BILL FOR EPA's NEW VCM EMISSION STANDARDS
Mod. Plast. 53 (2): 16 (1976)

EPA estimates that 20 companies producing PVC will have to spend $183 million to meet its proposed standard for VCM in air. Two highest costs will be borne by B.F. Goodrich ($28 million) and Tenneco Chemicals ($15 million). Additional costs of $70 million/yr are anticipated for operating controls, after installation. Another $83 million will have to be spent by industry to meet EPA's proposed new water effluent regulations, effective in 1983. Price of PVC resins may rise by 7.3%.

See: 41-0001, Acrylonitrile

41-0028
NITROSAMINES

Baldwin, Jack E. et al
CHEMICAL ACTIVATION OF NITROSAMINES INTO MUTAGENIC AGENTS
Tetrahedron Lett. (5): 333-6 (January 1976)

Nitrosopyrrolidine (NP), which occurs in fried bacon and in tobacco smoke, has produced liver and testicular tumors in rats. It is now shown that α-acetoxy-nitrosopyrrolidine (α-NP) is mutagenic *per se*, requiring no microsomal activation. The authors warn that such nitrosamines as the α-acetoxy compounds which are mutagenic *per se* are hazardous "contact carcinogens" and may be very dangerous at concentrations much lower than the parent nitrosamines.

41-0029
NITROSAMINES

Osterman-Golkar, S. et al
EVALUATION OF GENETIC RISKS OF ALKYLATING AGENTS. II. HAEMOGLOBIN AS A DOSE MONITOR
Mutat. Res. 34 (1): 1-10 (1976)

Mice were treated with ethylene oxide, a directly active alkylating agent, and with dimethylnitrosamine, an agent requiring metabolic activation. Determinations of the degree of alkylation of haemoglobin made at different times showed that analysis of alkylated amino acids in haemoglobin is a useful clinical method for genotoxic risk estimates for humans.

41-0030
NITROSAMINES

Ronen, A. and Rahat, Ana
MUTAGEN SPECIFICITY AND POSITION EFFECTS ON MUTATION IN T4rII NONSENSE SITES
Mutat. Res. 34 (1): 21-34 (1976)

N-Methyl-N'-nitro-N-nitrosoguanidine (NTG), hydroxylamine (HA), and 2-aminopurine (2AP) were the mutagens used to study spontaneous and induced interconversions of *ochre* (UAA) and *opal* (UGA) alleles and the reversion of the nonsense sites to r^+ in 14 sites in the T4rII region.

41-0031
NITROSAMINES

Pound, A.W. and Lawson, T.A.
PARTIAL HEPATECTOMY AND TOXICITY OF DIMETHYLNITROSAMINE AND CARBON TETRACHLORIDE, IN RELATION TO THE CARCINOGENIC ACTION OF DIMETHYLNITROSAMINE
Br. J. Cancer 32 (5): 596-603 (November 1975)

An increase in the yield of tumors in rat livers when dimethylnitrosamine (DMN) was administered to rats 1, 6, or 12 hours after partial hepatectomy and an even greater increase, when DMN was administered after 24 to 72 hours, confirms that this carcinogen does significantly affect the development of liver tumors after partial hepatectomy and that proliferating liver cells are more susceptible to it.

41-0032
NITROSAMINES

Hilfrich, J. et al
THE MODIFICATION OF THE RENAL CARCINOGENICITY OF DIMETHYLNITROSAMINE BY ACTINOMYCIN D AND A PROTEIN DEFICIENT DIET
Br. J. Cancer 32 (5): 578-87 (November 1975)

Rats given a single dose of (DMN) dimethylnitrosamine (30 mg) and then 6 µg of actinomycin D (before, after, or at the same time as the nitrosamine) did not show a statistically significant difference in the kidney tumors induced, compared to rats given DMN alone, when they were maintained on a normal diet.

On a protein deficient diet, however, rats given DMN or DMN with actinomycin D showed a significantly higher incidence of kidney tumors than did those given DMN alone and a normal diet.

41-0033
NITROSAMINES

Ryttman, H. and Zetterberg, G.
INDUCTION OF MITOTIC RECOMBINATION WITH N-METHYL-N'-NITRO-N-NITROSOGUANADINE (MNNG) IN SACCHAROMYCES CEREVISIAE. A COMPARISON BETWEEN TREATMENT IN VITRO AND IN THE HOST-MEDIATED ASSAY
Mutat. Res. 34 (2): 201-16 (1976)

N-Methyl-N'-nitro-N-nitrosoguanidine (MNNG), a monofunctional methylating agent, has been shown to be a powerful inducer of point mutations, chromosome aberrations, and cancer, but its mutagenic actions have been described in different ways, varying with test methods and test subjects used.

In this study, the induction of mitotic recombination by MNNG in *Saccharomyces cerevisiae* was tested in vitro and by the host-mediated assay method. The most effective doses of MNNG in vitro were ineffective in the host-mediated assay, indicating that because tested cells in the human body are less accessible to a mutagen or its metabolites false results may be recorded. Treatment in vitro showed damage to the recombinational system in the cells, judging from the fact that decreasing frequencies of mitotic recombination followed increasing doses of MNNG.

Krafft, S. and Onken, A.
INDUCTION OF MITOTIC GENE CONVERSION IN *SACCHAROMYCES CEREVISIAE* WITH CHLORDIAZEPOXIDE AND ITS N-NITROSO DERIVATIVE IN A HOST-MEDIATED ASSAY
Mutat. Res. 34 (2): 333-6 (1976)

After discovering that chlordiazepoxid, a tranquilizer, reacts with nitrite in isolated human gastric juice and in rat stomachs to form N-nitrosochlordiazepoxid, tests were conducted to determine the mutagenicity of this N-nitrosamine derivative as well as the mutagenicity of chlordiazepoxid, using the title organism as the mutation indicator. The test substances was injected subcutaneously into the backs of rats, whose livers were withdrawn after the rats were killed. Preliminary results showed that N-nitrosochlordiazepoxid induced a pronounced increase in mitotic gene conversion and that chlordiazepoxid had a weak but definite effect.

NITROSAMINES

See: 41-0022, Beta-Propiolactone

41-0035
GENERAL INFORMATION

Anon
IGT WEIGHS POTENTIAL OF FUELS FROM BIOMASS
Chem. Eng. News 54 (8): 24-6 (23 February 1976)

The Institute of Gas Technology announced at a recent symposium that conversion of biomass to synthetic fuels and chemical feedstocks in technically feasible, almost economically competitive, and environmentally attractive. Only 5% of the total world biomass, estimated at about 146 billion tons, could meet current U.S. oil and gas requirements. Marine plants (algae, water hyacinth, and kelp) are suggested materials under study. Kelp, via anerobic digestion, would yield methane primarily. IGT is studying various processing techniques. Other biomass conversion studies are underway by ERDA and other research groups.

41-0036
GENERAL INFORMATION

Anon
EPA HAS BANNED USE OF MERCURIAL PESTICIDES. . .
Chem. Eng. News 54 (8): 9 (23 February 1976)

Reversing a recent law decision, EPA has prohibited use of mercurial pesticides in paint, seed treatment, and golf course turf. The National Paint & Coatings Association urges paint companies to fight the ban. Paint makers claim that they have shown that no toxic compounds result from biomethylation in the environment of the phenylmercury compounds in paint.

41-0037
GENERAL INFORMATION

Anon
BACTERIA DESTROY PCBs
Chem. Week 118 (8): 47 (25 February 1976)

Canada Centre for Inland Waters, Burlington, Ontario, reports finding a new bacteria strain that breaks down toxic polychlorinated biphenyls in waste water. The carbon atoms of the persistent PCB's is the food source for the bacteria.

41-0038
GENERAL INFORMATION

Anon
SOLVENT BLAMED IN SUIT
Chem. Week 118 (7): 20 (18 February 1976)

Claiming brain and central nervous system damage from inhalation of 1, 1, 1-trichloroethane used as a solvent to clean a circuit breaker tank, a former employee of Duke Power Co., Charlotte, N.C., has sued Amerace Corp. for $2 million. The claim charges the supplier with failing to label its containers adequately.

41-0039
GENERAL INFORMATION

Seltzer, Richard J.
EFFORTS TO TAP OCEAN THERMAL ENERGY GAIN
Chem. Eng. News 54 (6): 19-20 (9 February 1976)

Deriving energy by ocean thermal energy conversion (OTEC) is again reviewed (See: CATS 39-0033) in Part I of a two-part series. Technical feasibility, costs, legal and political issues are discussed briefly.

41-0040
GENERAL INFORMATION

Anon
POTENTIAL OF OCEAN ENERGY SOURCES PROBED
Chem. Eng. News 54 (8): 26 (23 February 1976)

Part II of a series, this article discusses the six potential ocean energy sources other than ocean thermal energy conversion (OTEC). The six are: tides, waves, salinity gradients, currents, winds, and bioconversion. Ocean tides are now being tried commercially on a small scale in France and Russia, and the U.S. and Canada are re-examining this source of energy. ERDA will study wave energy possibilities. Technological and environmental problems may slow down exploitation of salinity gradients.

42-0001
ARSENIC

Brown, V.M.
ADVANCES IN TESTING THE TOXICITY OF SUBSTANCES TO FISH
Chem. Ind. (4): 143-9 (21 February 1976)

The adoption of a "standard toxicity test" by environmental biologists and the potential fallacy of the concept of acute lethal concentrations have, in the author's opinion, restricted the advance of methods that would permit more reliable testing of toxicity.

Twelve types of investigations are suggested for detecting and measuring toxic conditions, dismissing field tests as unimportant.

Geochemical differences in water suggest that fish might show a very slow whole body response to arsenic, lead, chromium, insecticides and other materials under certain conditions. Thus, an alarm to a potentially hazardous situation would come too late.

42-0002
ARSENIC

Anon
CANCER-LINK INQUIRIES
Chem. Week 118 (11): 16-17 (17 March 1976)

Studies at the Mount Sinai Hospital, N.Y., indicate that an arsenic-based pesticide may have caused deaths of four workers in Wisconsin from a rare liver cancer. The calcium arsenate pesticide was mixed by hand and sprayed by workers using hand pumps.

In another study, concentrations of 2-20% of asbestos fibers were detected in 9 of 19 cosmetic talc formulations tested. Five of the products contained 8% or more of asbestos, which is suspect in the induction of chest and abdominal cancers. According to the FDA, however, 76 commercial cosmetic talcs tested in 1975 contained no asbestos.

Hills, John P.
LEGAL DECISIONS AND OPINIONS IN POLLUTION CASES
Environ. Sci. Technol. 10 (3): 234-8 (1976)

This review of court cases involving such toxic substances as asbestos, vinyl chloride, organochlorine pesticides, and lead, indicates the importance of the reciprocal relationship between risk and harm.

U.S. courts are accepting substantial scientific evidence of harm as a basis for decision, but are also accepting expert opinion when there are gaps in such evidence or when the matter is "impossible of proof".

ASBESTOS

See: 42-0002, Arsenic

Rinde, Esther and Troll, Walter
COLORIMETRIC ASSAY FOR AROMATIC AMINES
Anal. Chem. 48 (3): 542-4 (March 1976)

Fluram (fluorescamine), a colorless reagent with which aromatic amines form stable yellow derivatives, provides a means of detecting aromatic amines in urine and water in the nanomole range. Use of thin-layer chromatography allows specific aromatic amines to be measured. Tests conducted with benzidine, mono-acetyl banzidine, tolidine, dichlorobenzidine, and 2-naphthylamine are discussed.

42-0005
BENZIDINE

Raloff, Janet
CARCINOGENIC CHEMICALS IN SCHOOL LABORATORIES
Chemistry 49 (2): 24-6 (March 1976)

Teachers and students run risk from exposure in school laboratories to such potential carcinogens as benzidine, 2-naphthylamine, and vinyl chloride, which were found in open containers in a Kentucky school. A survey questionnaire showed that 17 of 350 high schools and 26 of 41 colleges had some of 14 chemicals identified as potential carcinogens in their laboratories, indicating need to alert schools to enforce safety standards for exposure.

Anon
DIOXANE-BASED HERBICIDE CAN CONTROL TOUGH, PERENNIAL WEEDS
Chem. Week 118 (10): 43 (10 March 1976)

FMC's Agricultural Chemicals Division in Philadelphia is determining the feasibility of commercializing a new dioxane-based pre-emergence herbicide (*r*-2-ethyl-5-methyl-*c*-5-(2-methylbenzyloxy)-1,3-dioxane). The product controls nutsedge, Johnson grass, and Bermuda grass. In other countries it has been tested on soybeans, peanuts, potatoes, tomatoes, fruit trees, and vines.

St. John, L.E., Jr. et al
STUDIES OF POSSIBLE ABSORPTION OF A FLAME RETARDANT FROM TREATED FABRICS WORN BY RATS AND HUMANS
Bull. Environ. Contam. Toxicol. 15 (2): 192-7 (1976)

Because organophosphorus insecticides have been shown to undergo hydrolysis to their corresponding acids and alcohols, when they are absorbed by mammalian species, the possible effects of using tris (2,3-dibromopropyl) phosphate (TBPP) as a flame retardant for children's sleepwear were investigated. TBPP hydrolyzes to 2,3-dibromopropanol (DBP). Rats, who received direct application of TBPP on their skin, showed DBP in their urine. No DBP was detected in the urine of a rat, a man, and a young boy, who wore TBPP-finished fabrics for up to 9 days, but DBP in small amounts appeared in the urine of a rat that chewed on the fabric.

FLAME RETARDANTS

See also: 42-0020, Polyurethanes

42-0008
FLUOROCARBONS

Lamb, Brian K. and Shair, F.H.
DETERMINATION OF CONCENTRATIONS OF HALOGENATED COMPOUNDS DISSOLVED IN VARIOUS LIQUIDS BY ELECTRON CAPTURE GAS CHROMATOGRAPHY
Anal. Chem. 48 (3): 473-5 (1976)

Because oceans may be possible natural sources and sinks for Freons and other halogenated compounds, a technique is described that may permit determination of oceanic concentrations of halogenated compounds. This technique, based upon analysis by means of electron capture gas chromatography, is faster than volumetric-manometric solubility methods and is accurate to about ± 6%.

42-0009
FLUOROCARBONS

Chang, Kun and Chiou, Win L.
FLUOROCARBON AEROSOL PROPELLANTS VIII: SOLUBILITY OF TRICHLOROMONOFLUOROMETHANE IN DOG BLOOD AND TISSUE HOMOGENATES
J. Pharm. Sci. 65 (1): 53-5 (1976)

In this study of the solubility of a fluorocarbon, the partition coefficients of trichloromonofluoromethane in tissue of dog heart and kidney are higher at lower equilibrium constants. Pharmacokinetic implications are discussed.

42-0010
FLUOROCARBONS

Chang, Kun and Chiou, Win L.
FLUOROCARBON AEROSOL PROPELLANTS IX: ADSORPTION ON ACTIVATED CHARCOAL
J. Pharm. Sci. 65 (1): 56-60 (1976)

Adsorption isotherms of trichlorofluoromethane, dichlorofluoromethane, and dichlorotetrafluoroethane at 25° are plotted. Results indicate that activated carbon is an effective adsorbent for removing aerosol propellants from the air.

42-0011
FLUOROCARBONS

Niazi, Sarfaraz and Chiou, Win L.
FLUOROCARBON AEROSOL PROPELLANTS X: PHARMACOKINETICS OF DICHLOROTETRAFLUOROETHANE IN DOGS
J. Pharm. Sci. 65 (1): 60-4 (1976)

Dichlorotetrafluoroethane was given i.v. to dogs and its disposition in the animal was studied using a three-compartment disposition model with average half-lives of 1.3, 9.6, and 50.8 min for the 3 disposition phases. Tissue compartment distribution analysis showed pseudo-distribution equilibration to be achieved in about 2 hr; over 90% of the compound remaining in the body appeared in the tissue compartments. A table shows the disposition half-lives in the initial, intermediate, and final disposition phases. Terminal disposition half-lives of dichlorotetrafluoroethane of about 50 min were longer than previously reported.

Koss, G. and Manz, D.
RESIDUES OF HEXACHLOROBENZENE IN WILD MAMMALS OF GERMANY
Bull. Environ. Contam. Toxicol. 15 (2): 189-91 (1976)

Examination of the adipose tissues of German foxes, wild boars, and does showed residues of hexachlorobenzene in all of the foxes and wild boars and in 4 of 6 does. Mean levels of residues (lowest in the does) ranged from 0.03-0.71 μg/g wet tissue, although one boar had a high level of 3.11. Differences in residue levels among the animals were attributed to differences in food habits.

HEXACHLOROBENZENE

See also: 42-0021, Trichloroethylene

42-0013
HYDRAZINE

Springer, D.L. and Dost, F.N.
INCREASED ORNITHINE DECARBOXYLASE ACTIVITY FOLLOWING INTOXICATION BY HYDRAZINE DERIVATIVES
Abstract of Paper to be Presented at the 60th Ann. Mtg. of the Fed. Proc., Fed. Am. Soc. Exp. Biol., Anaheim, CA, April 11-16, 1976, 35 (3): 505
(1 March 1976)

A study of the effects of hydrazine (Hz) derivatives, which are inhibitors of pyridoxal dependent enzymes, on the pathway of polyamine biosynthesis, including ornithine decarboxylase (ODC), showed that Hz derivatives increased ODC activity. A sharp increase in rat liver ODC activity, reaching a maximum in 4 hours, followed acute Hz intoxication. This acute intoxication also greatly increased the half-time of ODC degradation.

42-0014
HYDRAZINE

Toth, Bela and Nagel, Donald
STRUCTURE ACTIVITY STUDIES WITH METHYLATED HYDRAZINES IN TUMORIGENESIS
Abstract of Paper to be Presented at the 60th Ann. Mtg. of the Fed. Proc., Fed. Am. Soc. Exp. Biol., Anaheim, CA, April 11-16, 1976, 35 (3): 409
(1 March 1976)

Hydrazine, monomethyl-, 1,2-dimethyl-, 1,1-dimethyl-, trimethyl-, and tetramethylhydrazines were given to Swiss mice in their drinking water at the maximum tolerated dose for life. Results are reported in this study for only the last two compounds. Tumors of blood vessels, lungs, and kidneys followed administration of 0.05% trimethylhydrazine hydrochloride, while 0.125% tetramethylhydrazine hydrochloride induced blood vessel tumors. On the basis of this and earlier studies, 1,2-dimethylhydrazine dihydrochloride was judged the most potent carcinogen.

Anon
ISOCYANATE PRICES RAISED BY THREE PRODUCERS
Chem. Week 118 (11): 26 (17 March 1976)

Upjohn and Mobay announced increases of 2¢/lb for their isocyanates in bulk, effective 1 April 1976. New price for Upjohn's PAPI polymeric isocyanate will be 49¢/lb. On 1 June, Olin will raise its bulk price of 40¢/lb for tolylene diisocyanate to 51¢/lb.

Haebig, Jon E. et al
PRELIMINARY SMALL-SCALE COMBUSTION TESTS OF COAL LIQUIDS
Environ. Sci. Technol. 10 (3): 243-7 (1976)

Fuels produced in a bench-scale version of the Gulf Catalytic Coal Liquefaction process were burned to determine their air emissions. The results showed low emissions of sulfur oxides, CO, hydrocarbons, and smoke. NO_x emissions ranged between 200 and 400 ppm.

Wallace, Robert T.
ENERGY: WHAT ARE THE BEST ALTERNATIVES?
Chem. Eng. 83 (6): 121-5 (1 March 1976)

Seven basic recommendations for solving the world's energy problem derive from this review of alternatives for petroleum and natural gas. Positive suggestions include speeding up the growth of nuclear-generated electricity and developing coal hydrogenation for the production of liquid fuels for the transportation field. Downgraded is the production of methanol from coal or heavier hydrocarbons.

Anon
ERDA TO BACK PROJECTS TO CONVERT COAL INTO SYNTHETIC GASOLINE
Chem. Week 118 (11): 10 (17 March 1976)

ERDA plans awarding about $5 million in contracts to Gulf Research and Development Co., Sun Ventures, Inc., and the Institute of Gas Technology (IGT) for development of coal liquefaction processes. Technical and economic feasibility studies will be conducted by Gulf on a "delayed coking" unit, by Sun Ventures on its proposed catalyst containing molybdena and alumina, and by IGT on a "flash hydropyrolysis" unit.

See: 42-0004, Benzidine

See: 42-0005, Benzidine

42-0019
POLYURETHANES

Krishman, Sundaram
POLYURETHANE COATINGS TO MEET AIR POLLUTION REGULATIONS
Abstract of Paper to be Presented at AATCC Symposium on New Developments in Coated Fabrics, March 31 - April 1, 1976, Newton, Mass.
in: Text. Chem. Color. 8 (3): 40 (1976)

Review of polyurethane chemistry relative to fabric coatings indicates solvent based coatings emit large quantities of solvent into air unless solvents used are not photochemically active. Latter, however, raise costs and give rise to potential health hazards from use of chlorinated solvents. Suggested alternatives include the use of water based solvents, of solvent recovery techniques, and polyurethane latices.

42-0020
POLYURETHANES

Ulmachneider, Ronald W.
FLAME RETARDANT URETHANE COATINGS
Abstract of Paper to be Presented at AATCC Symposium on New Developments in Coated Fabrics, March 31 - April 1, 1976, Newton, Mass.
in: Text. Chem. Color. 8 (3): 41 (1976)

Flame retardant urethane coatings developed for flame-resisting tenting materials are based on the use of such FR additives as antimony trioxide, chlorinated paraffins, trisdibromopropyl phosphate or on FR compounds containing hydroxyl or amino groups. Problems connected with use, testing, and usefulness of flame retardant coatings are discussed.

Moslen, Mary Treinen et al
CORRELATIONS BETWEEN THE CHEMICALLY INDUCED POTENTIATION OF TRICHLOROETHYLENE HEPATOTOXICITY AND ITS METABOLISM
Abstract of Paper to be Presented at 60th Ann. Mtg. of the Fed. Proc., Fed. Am. Soc. Exp. Biol., Anaheim, CA, April 11-16, 1976, 35 (3): 375
(1 March 1976)

Rats weighing 200 g were pretreated with 400 μmoles/kg/day of phenobarbital, hexachlorobenzene, and several other chemicals before being exposed to trichloroethylene (1% x 2 hr). Morphological injury and elevated serum transaminase were noted. The hepatotoxicity as well as the metabolism of trichloroethylene is enhanced by induction of the mixed function oxidase system.

42-0022
VINYL CHLORIDE

Vervalin, Charles H.
CURTAIL VINYL CHLORIDE EXPOSURE
Hydrocarbon Process. 55 (2): 182, 184, 186 (1976)

Brief review of systems and equipment installed by B.F. Goodrich and Robintech to meet OSHA's requirements for worker exposure of less than 1 ppm of VCM averaged over an 8-hr period, and 5 ppm over any 15-minute period.

42-0023
VINYL CHLORIDE

Richards, R.J. et al
A SURFACE-ACTIVE AGENT INVOLVED IN PVC-INDUCED HAEMOLYSIS
Nature 260 (5546): 53-4 (4 March 1976)

The haemolysis produced *in vitro* by some forms of PVC particles is shown to be caused by the presence on their surface of the ionic detergent used in their preparation and not to the VC monomer. The haemolytic action is associated primarily with PVC paste or emulsion powders rather than with suspension PVC homopolymers.

42-0024
VINYL CHLORIDE

Wegman, David H. et al
VINYL CHLORIDE: CAN THE WORKER BE PROTECTED?
N. Engl. J. Med. 294 (12): 653-7 (18 March 1976)

The vinyl chloride story is reviewed as an illustration of the need for methods of evaluating occupational hazard levels and for procedures to respond to demonstrated dangers. As early as 1938 the acute toxicity of VC to guinea pigs, mice, and dogs was reported. Other published studies that followed should have indicated the potential VC hazard. Various toxicity studies indicate the value of toxicological screenings outside the workplace and on non-human species. In retrospect, 1 year of testing on lower vertebrates could have shown the carcinogenicity of VC to man, which did not become evident until 20 years after his first exposure to the compound. High cost of controls compared to worker compensation payments argue for incentives for manufacturers to protect workers' health.

42-0025
VINYL CHLORIDE

Anon
AT EPA HEARINGS ON VCM AIR EMISSIONS: NEW RESEARCH HOPE, AND AN OLD GHOST
Mod. Plast. 53 (3): 16 (1976)

At recent EPA hearings, Dow Chemical reported on research that indicates the dynamics of VCM disposition in the human body change with the dose level (oral or inhaled). Apparently, the body's glutathione disposes of some VCM without toxicological effect. Above this level, the glutathione is ineffective and the VCM then makes its way into cell structures to cause toxic reactions. Results of tests with 500 ppm concentrations cannot, however, be extrapolated to lower concentrations. Dow suggests that there may be a threshold concentration of VCM below which no carcinogenicity can be expected.

See: 42-0003, Asbestos

See: 42-0005, Benzidine

Nauman, C.H. et al
COMPARATIVE EFFECTS OF IONIZING RADIATION AND TWO GASEOUS CHEMICAL MUTAGENS ON SOMATIC MUTATION INDUCTION IN ONE MUTABLE AND TWO NON-MUTABLE CLONES OF TRADESCANTIA
Mutat. Res. 38 (1): 53-70 (February 1976)

Comparisons are made of the mutagenic potential of 1,2-dibromoethane (DBE), ethyl methanesulfonate (EMS), and ionizing radiation on three clones (clone 02, mutable clone 0106, and clone 4430) of Tradescantia. In all cases, DBE and EMS showed a mutagenic potential equal to at least 10 rad of X-rays. DBE is less mutagenic than EMS.

42-0027
NITROSAMINES

Kakizoe, Tadao et al
EFFECT OF LEUPEPTIN, A PROTEASE INHIBITOR, ON INDUCTION OF BLADDER TUMORS IN RATS BY N-BUTYL-N-(4-HYDROXYBUTYL) NITROSAMINE
J. Nat. Cancer Inst. 56 (2): 433-5 (1976)

Carcinogenicity of N-butyl-N-(4-hydroxybutyl)nitrosamine (BBN) is enhanced by leupeptin, a potent and specific inhibitor of proteases. Rats that had been given a 0.05% solution of BBN in drinking water for 6 weeks were then fed for 30 weeks on a diet containing 0.1% leupeptin. These rats had bladders with tumors that weighed 8 times as much as the bladders with tumors in control rats.

42-0028
NITROSAMINES

Green, M.H.L. and Muriel, W.J.
MUTAGEN TESTING USING TRP$^+$ REVERSION IN *ESCHERICHIA COLI*
Mutat. Res. 38 (1): 3-32 (February 1976)

Mutagen screening tests described are: spot tests, treat and plate tests, a simplified fluctation test (for detection of weak mutagens), and use of *E. coli* with liver microsomal preparations. Types of DNA damage induced by certain agents, including N-methyl-N'-nitro-N-nitroso guanidine and N-nitroso-N-methyl-urea (ethyl methanesulfonate), are described.

Shank, R.C. and Newberne, P.M.
DOSE-RESPONSE STUDY OF THE CARCINOGENICITY OF DIETARY SODIUM NITRITE AND MORPHOLINE IN RATS AND HAMSTERS
Food Cosmet. Toxicol. 14 (1): 1-8 (1976)

Because nitrite and morpholine combined at concentrations found in food products could form carcinogenic levels of nitrosated morpholine, rats and hamsters were given diets containing up to 1000 ppm each of nitrite and morpholine or 5 to 50 ppm of N-nitrosomorpholine. A dose-response relationship is indicated for induction by nitrite and morpholine of liver and lung tumors, which were identical to tumors caused by the nitroso compound.

NITROSAMINES

See: 42-0026, Ethylene Dibromide

42-0030
GENERAL INFORMATION

Burnett, Clyde
SAFETY OF HAIR DYES (Letter to Editor)
Lancet 1 (7957): 482 (28 February 1976)

The author reports that his studies with two nitro-phenylenediamine dyes used in hair-dye formulations showed the dyes to have no mutagenic or teratogenic effects. These results are contrary to those reported earlier by Searle et al (See: CATS 23-0023).

42-0031
GENERAL INFORMATION

Anon
CHLOROFORM TAGGED AS CARCINOGEN IN MICE
Chem. Eng. News 54 (10): 6 (8 March 1976)

Because the National Cancer Institute has found that chloroform causes liver cancer when fed to mice in corn oil and causes kidney epithelial tumors in rats, the FDA plans to ban the use of chloroform in cough medicines, toothpaste, and mouthwashes. About 260 million lb/yr of chloroform is produced by such companies as Dow Chemical, Stauffer Chemical, Vulcan, Allied Chemical, and Diamond Shamrock.

42-0032
GENERAL INFORMATION

Anon
CHECKING OUT RED 40
Chem. Week 118 (10): 23 (10 March 1976)

Allied Chemical has supplied FDA with preliminary data indicating the potential carcinogenicity of Red Dye No. 40. Fifteen out of 300 mice that had been fed 0.37%, 1.39%, or 5.19% Red 40 died 41 weeks into a 78-week feeding study; three controls also died. Six of the deceased test animals had cancerous tumors of the lymph glands.

42-0033
GENERAL INFORMATION

Anon
ETHYLENE AND TOLUENE ARE FIRST IN LINE FOR TOXICOLOGICAL TESTS
Chem. Week 118 (11): 39 (17 March 1976)

Industrial Bio-test Laboratories, Northbrook, Ill., will expose rats for over two years to ethylene and toluene to determine the potential toxicity of inhaling these widely used chemicals. The studies are being done for the new Chemical Institute of Toxicology, which also plans inhalation and feeding studies for aniline, chlorine, dinitrotoluene, ethylene oxide, formaldehyde, normal hexane, maleic anhydride, methylene dichloride, and phenol.

43-0001
ACRYLONITRILE

Anon
A JAPANESE FIRM'S SEARCH FOR AN ACRYLONITRILE CATALYST....
Chem. Eng. 83 (7): (7): 64 (29 March 1976)

Nitto Chemical Industry Co. (Tokyo) has developed an acrylonitrile catalyst said to give higher yields than Sohio's catalyst-41. Sohio holds Western Hemisphere licensing rights to the new product and may make it available to other companies after the Spring of 1977.

43-0002
ACRYLONITRILE

Anon
NEW PLANTS AND FACILITIES. . . CE CONSTRUCTION ALERT
Chem. Eng. 83 (7): 129-38, 140 (29 March 1976)

Over 300 plants recently completed or under construction by the chemical process industries are listed. Included are: Monsanto's 500 million lb/yr acrylonitrile plant (world's largest) in Texas City, Texas, scheduled for completion in 1976; Diamond Shamrock's $100-million, 1 billion lb/yr VCM plant in LaPorte, Texas, which should be onstream in mid-1978; Dow Chemical's vinyl chloride plant in Plaquemine, La., scheduled for 1978, and its toluene diisocyanate plant in Freeport, Texas, which should be near completion now; the 50% expansion of Upjohn's LaPorte, Texas, isocyanates facility, costing $20 million; Firestone's 25% expansion of its polyurethane foam plant in Milan, Tenn., with a mid-1977 completion date; and several ERDA-sponsored coal gasification/liquefaction plants.

43-0003
ARSENIC

NIOSH
CRITERIA FOR A RECOMMENDED STANDARD-OCCUPATIONAL EXPOSURE TO INORGANIC ARSENIC.
NEW CRITERIA 1975.
PB-246 701

Contents:
- Recommendations for an inorganic arsenic standard;
- Biologic effects of exposure;
- Environmental data and biologic evaluation;
- Development of the standard;
- References.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.137 (1 March 1976)]

43-0004
ARSENIC

Furr, A. Keith et al
STUDY OF GUINEA PIGS FED SWISS CHARD GROWN ON MUNICIPAL SLUDGE-AMENDED SOIL
Arch. Environ. Health 31 (2): 87-91 (March/April 1976)

Guinea pigs fed for 28 days on Swiss chard grown on soil treated with municipal sewage sludge suffered no obvious toxicological effects. Neutron activation and other analytical techniques showed 41 elements to be present in various tissues of the animals, as well as in the sludge and the plant material. Animals fed the Swiss chard grown on sludge-treated soil showed higher concentrations of antimony in adrenal tissues, cadmium in kidney tissues, and manganese in liver tissues. Arsenic and molybdenum were present in higher concentrations in Swiss chard grown on a neutral soil to which no sludge was added, while antimony, copper, tin and zinc were found in higher concentrations in both a neutral and an acid soil fortified with sludge.

See also: 43-0014, Fluorocarbons

43-0005
ASBESTOS

Anon
FIBERS AND FABRICS
Rubber Age 108 (3): 12 (March 1976)

Using a proprietary method, Jim Walter Resources Inc., Birmingham, Alabama, offers a totally inorganic processed mineral fiber (from mineral wool, fiberized blast furnace slag) that can serve as an asbestos substitute in many uses.

43-0006
ASBESTOS

Anon
NEW MEMBRANES CUT CHLOR-ALKALI COSTS
Chem. Week 118 (12): 33,36 (24 March 1976)

New perfluorosulfonic acid resin films developed by Diamond Shamrock now under test by chlorine manufacturers as replacements for asbestos in diaphragm cells are a modification of Du Pont's Niafon. Although the new film is expected to help cut operating costs while improving the quality of chlorine and caustic, the new membrane is less efficient electrically than asbestos diaphragms.

Wolff, Mary S. et al
GAS CHROMATOGRAPHS: HEALTH EFFECTS (Letter to Editor)
Science 191 (4225): 339-40 (30 January 1976)

Gas chromatographs insulated with chrysotile or amosite asbestos have produced sufficient dust to indicate that their use could be a hazard to those using the chromatographs daily. Use of another material or an asbestos block in which the fiber has been completely sealed is recommended.

43-0008
FLAME RETARDANTS

Anderson, Earl V.
GOVERNMENT RULES: PROBLEMS, OPPORTUNITIES
Chem. Eng. News 54 (12): 12-3 (22 March 1976)

Federal consumer protection laws may put some small manufacturers out of business because of the high costs of pollution control systems or the testing of new chemicals, according to speakers at a recent NYC meeting of the Commercial Development Association. Nevertheless, some new regulations carry the promise of increased business, as indicated by the growth of flame-retardant chemicals. In 1975, this market ranged between 312 million and 360 million lb, about 70% of which were accounted for by carpets and rugs. Total fire retardant market may zoom to a high of 425 million to 525 million lb by 1980, at which time 50% to 60% is expected to be used in carpets and rugs.

43-0009
FLAME RETARDANTS

Morrow, Raymond W. et al
TRIS (2,3-DIBROMOPROPYL) PHOSPHATE: HUMAN CONTACT SENSITIZATION
Am. Ind. Hyg. Assoc.,J. 37 (3): 192-7 (1976)

Tris(2,3-dibromopropyl) phosphate (TBP), identified as a low level allergen, caused sensitization in human maximization tests, which appeared to be dose related. In human patch and wear tests, some previously sensitized subjects reacted to fabrics containing TBP especially when surface concentration was high.

Anon
FLAME RETARDANT FOR CHILDREN'S SLEEPWEAR MAY POSE CANCER RISK
Chem. Week 118 (13): 10 (31 March 1976)

Dibromopropyl phosphate flame retardants, which are used in children's sleepwear, are potential carcinogens, according to the Environmental Defense Fund in petitioning the Consumer Product Safety Commission to act immediately to reduce human exposure to fabrics treated with the chemical.

43-0011
FLUOROCARBONS

Anon
SKIN CANCER RESULTING FROM REDUCTION IN THE EARTH'S OZONE LAYER. . .
Chem. Eng. News 54 (11): 29 (15 March 1976)

Studies by professor Elizabeth L. Scott, UCal, using such parameters as clothing, occupations, and people's natural tendency to sunburn, indicate skin cancers might increase 30 to 40% instead of the 20 to 30% previously estimated should 10% of the stratospheric ozone be destroyed.

43-0012
FLUOROCARBONS

Scorer, R.S.
A COMMENTARY ON OZONE DEPLETION THEORIES
Atmos. Environ. 10 (2): 177-80 (1976)

Reviewing the chemistry and dynamics of the ozone depletion theories, the author suggests that conclusions about harmful biological effects are premature and wrong.

43-0013
FLUOROCARBONS

Lebowitz, Michael D.
AEROSOL USAGE AND RESPIRATORY SYMPTOMS
Arch. Environ. Health 31 (2): 83-6 (March/April 1976)

An epidemiological survey of 3,485 men and women in Tucson, Arizona, who use aerosol sprays (deodorants, hair sprays, air fresheners, etc.), indicated that wheezing, coughing and other respiratory systems were more evident among heavy aerosol users. Nonsmokers seemed to show more symptoms than smokers. Additional epidemiological studies plus in vitro and in vivo animal studies are recommended.

43-0014
FLUOROCARBONS

Hayes, Wayland J.
MORTALITY IN 1969 FROM PESTICIDES, INCLUDING AEROSOLS
Arch. Environ. Health 31 (2): 61-72 (March/April 1976)

Because the 72 deaths reported from pesticides in 1968 were well below the 100 to 152 range for 1946-1961, an analysis of the 1969 deaths from pesticides was conducted to determine if the accident rate was actually going down or if earlier reports had contained errors. In 1969 there were 62 accidental deaths and 20 suicides from pesticides, plus 5 deaths incorrectly attributed to these chemical products. Three of the 1969 deaths were from aerosol formulations and the data confirmed that intensive inhalation of an aerosol can sensitize the heart to fatal arrhythmia. Included among the components of pesticides that caused deaths in 1969 or earlier years were arsenicals and ethylene dibromide.

Parkes, D.G.
A SIMPLE GAS CHROMATOGRAPHIC METHOD FOR THE ANALYSIS OF TRACE ORGANICS IN AMBIENT AIR
Am. Ind. Hyg. Assoc.,J. 37 (3): 165-73 (1976)

The described method for determining ppb amounts of organic vapors in air, which uses adsorption, heat desorption, and F.I.D. gas chromatography, is applicable to bischloromethyl ether and vinyl chloride.

Courtney, K. Diane et al
THE EFFECTS OF PENTACHLORONITROBENZENE, HEXACHLOROBENZENE, AND RELATED COMPOUNDS ON FETAL DEVELOPMENT
Toxicol. Appl. Pharmacol. 35 (2): 239-56 (1976)

Mice of the C57Bl/6 and CD-1 strains and CD rats were fed diets containing pentachloronitrobenzene (PCNB), one sample of which was contaminated with hexachlorobenzene (PCNB-con) to test the teratologic and carcinogenic effects of these compounds.

PCNB with varying contaminants caused cleft palate and renal agenesis in C57Bl/6 mice, cleft palate in CD-1 mice, but no teratogenic effects in CD rats. PCNB-con caused cleft palates and some kidney malformations in CD-1 mice. The latter resulted from a 100 mg kg dose of HCB. These and other effects are discussed with the recommendation that additional studies be conducted with HCB to determine its fetal effects in mice and its potential effects on human fetal development.

Anon
ISOCYANATE
Chem. Eng. News 54 (13): 11 (Mar. 29, 1976)

Mobay will be onstream in spring 1976 with a new aliphatic isocyanate plant, size not reported, in Baytown, Texas.

ISOCYANATES

See: 43-0002, Acrylonitrile

Anon
COAL CONVERSION PROGRESS
Chem. Week 118 (12): 13 (24 March 1976)

Progress is reported for two experimental coal conversion projects with Hydrocarbon Research, Inc. (HRI) anticipating ERDA approval for building a coal liquefaction pilot plant producing 600 tons/day in 1978, and with two seven-day runs producing up to 25 million cu ft/day of synthesis gas at a coal gasification project near Edinburgh, Scotland. The latter is sponsored by a consortium of 15 U.S. firms, coordinated by Conoco Coal Development.

LIQUEFACTION AND GASIFICATION OF COAL

See: 43-0002, Acrylonitrile

43-0019
MODEL ECOSYSTEMS

Rolfe, Gary L. et al
AN ECOSYSTEM ANALYSIS OF ENVIRONMENTAL CONTAMINATION BY LEAD
PB-248 593. Illinois Univ. at Urbana-Champaign, Inst. for Environ. Studies.
UILU-IES-75-0001 (August 1975)

An 86-square-mile watershed in east-central Illinois, predominantly agricultural with a small urban area, was studied to determine the movement of lead into and through the area. The accumulation of lead in the terrestrial and aquatic biota were also examined. Combustion of gasoline was found to be the major source of lead input, accounting for 29,000 kg per year. Of this amount, about 13,000 kg remain airborne while 16,000 kg are deposited at ground level. Lead leaves the watershed at a rate of 910 kg per year through drainage water. The balance, 14,800 kg or 92.5% of the annual input, remains within the watershed. Lead concentrations in air, soils, stream sediments and the terrestrial and aquatic biota were determined. At present lead concentrations, there is no apparent adverse effect on plants and animals. No biological magnification was discovered except in insect food chains. The major lead reservoirs are the soils, plants, and stream sediments. The highest lead concentrations and a major portion of the stored lead are associated with the urban region and with areas adjacent to high-use rural roads.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.150 (8 March 1976)]

43-0020
MODEL ECOSYSTEMS

Goldsmith, John R.
FOOD CHAIN AND HEALTH IMPLICATIONS OF AIRBORNE LEAD
PB-248 745. Calif. State Health and Welfare Agency, Berkeley, Epidemiological Studies Lab. ARB-R-102-74-36 (September 1974)

Air samples and food samples reflecting usual local purchase and consumption habits were obtained in five areas in California. In addition, blood and urine samples from adults and children were obtained and analyzed for lead or for metabolic evidence of lead exposure. The first hypothesis tested was that there was a relationship between ingestion of lead by humans through food chain mechanism and blood lead levels. The second hypothesis tested was that there was an important association between airborne lead levels, and lead levels in blood or evidence of impairment of biochemical processes through the effect on delta-amino-levilinic acid dehydratase. Further studies of the factors influencing lead levels in the blood of children in Los Angeles and in San Diego are reported. There is no appreciable contribution of food lead levels to lead body burden as reflected by blood lead or other biological indices. Blood lead among school children in Burbank is significantly higher than in Manhattan Beach, and blood lead among adults is higher in Crockett than in Benicia.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, pp.150-1 (8 March 1976)]

Colwell, Rita R. and Nelson, John D., Jr.
METABOLISM OF MERCURY COMPOUNDS IN MICROORGANISMS
PB-249 000. Maryland Univ., College Park, Dept. of Microbiology (October 1975)

The report describes the physiology and ecology of mercury-resistant and mercury-metabolizing bacteria from Chesapeake Bay. Evidence is presented which establishes a role for bacteria in the cycling of mercury in the estuarine environment. From the results of a survey of elemental mercury production among a group of randomly selected, HgCl2-resistant bacteria and mixed natural microbial populations, it was established that the enumeration of mercury-resistant bacteria by plate counting is a valid index of potential Hg(+2) metabolism in situ. The distribution of mercury-resistant bacteria was significantly different in water and sediment, from station to station, and seasonally; the proportion of Hg(+2)- resistant bacteria among the total, viable, heterotrophic bacterial population reached a reproducible maximum in Spring and was positively correlated with water turbidity, dissolved oxygen concentration, and mercury concentration in the sediment. These findings suggest that bacteria may contribute substantially to the mobilization and transformation of mercury from existing deposits in Chesapeake Bay.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.152 (8 March 1976)]

Copenhaver, E.D.
NSF-RANN TRACE CONTAMINANT ABSTRACTS
ORNL-EIS-75-60 (V.2) (No.2). Oak Ridge Nat. Lab., Tenn. (May 1975)

One of a monthly series of bulletins presenting abstracts of papers that discuss the biological effects of trace amounts of toxic contaminants in aquatic and terrestrial ecosystems, including author and subject indexes. This May issue contains abstracts of 98 papers; issue No. 3, June 1975, contains abstracts of 30 papers. [Abstract in: NTIS Weekly Govt. Abstracts, Med. & Biol., p. 150 (8 March 1976)]

43-0023
MODEL ECOSYSTEMS

Lehmann, Edward J.
ECOLOGY OF INSECTICIDE WATER POLLUTION. VOLUME 1. 1964-1973 (A BIBLIOGRAPHY WITH ABSTRACTS)
NTIS/PS-76/0035 (January 1976)

The volume contains abstracts covering Federally-funded research reports concerning all aspects of insecticides in the water environment—lakes, rivers, oceans, estuaries, and ground water. The topics cover the effects upon plants and animals, chemical deterioration in soils and water, sources, pollution by, and accumulation in soils, plants, and animals. (Contains 206 abstracts).

43-0024
MODEL ECOSYSTEMS

Lehmann, Edward J. and Brown, Robena J.
ECOLOGY OF INSECTICIDE WATER POLLUTION. Volume 2. 1974-1975 (A BIBLIOGRAPHY WITH ABSTRACTS)
NTIS/PS-76/0036 (January 1976)

The volume on Government-sponsored research reports contains abstracts on insecticides in the water environment. This includes lakes, rivers, oceans, estuaries, streams, and ground water. The topics cover the effects upon plants, animals, and humans. Chemical deterioration in soils, plants, and animals are described. (This updated bibliography contains 152 abstracts, 90 of which are new entries to the previous edition.)

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.160 (8 March 1976)]

Fernandez, J. et al
EXPERIMENTAL HUMAN EXPOSURES TO TETRACHLOROETHYLENE VAPOR AND ELIMINATION IN BREATH AFTER INHALATION
Am. Ind. Hyg. Assoc.,J. 37 (3): 143-50 (1976)

Twenty-three men and one woman were exposed to tetrachloroethylene vapor for 1 to 8 hours at concentrations of 100, 150, and 200 ppm and alveolar breath concentration was measured during and after exposure. In subjects exposed to 100 ppm of the vapor for 8 hours there was a rapid rise of concentration in exhaled alveolar air in the first few minutes followed by a slower rise until the end of the exposure. Post-exposure analysis showed that tetrachloroethylene concentration in alveolar air decreases rapidly following an exponential decay. Complete elimination of retained chlorine in subjects exposed to 100 ppm for 8 hours took over 2 weeks. Results indicate that breath decay curves can serve as a means of monitoring time-weighted average exposures to tetrachloroethylene.

43-0026
POLYURETHANES

Anon
SEES PACKAGING POTENTIAL FOR NEW FOAM
Mod. Packag. 49 (3): 7 (1976)

W.R. Grace's new polyurethane foam, Hypol FHP (foamable hydrophilic polyisocyanate), which is a one-component system requiring only water to catalyze foaming action, is inherently less flammable. In spite of costing 15-20% more than conventional foams, Hypol requires less complicated dispensing applicators than those required for two-component systems and thus seems to be gaining interest as a packaging material.

43-0027
POLYURETHANES

Medina, Daniel
MAMMARY GLAND AS A MORPHOLOGICAL END POINT IN CARCINOGENESIS STUDIES
J. Toxicol. Environ. Health 1 (4): 551-60 (March 1976)

A model is presented for the sequence of events in mouse mammary tumorigenesis, which shows two sequential transformations occurring -- transformation of normal cells to nodule cells (preneoplastic lesions) and then the transformation of the nodules to neoplastic cells. Urethan is one of the chemicals mentioned as a mammary carcinogen in mice and rats.

See: 43-0002, Acrylonitrile

43-0028
TRICHLOROETHYLENE

Anon
CANCER LINK SHOWN FOR TRICHLOROETHYLENE
Chem. Eng. News 54 (14): 4 (5 April 1976)

Animal tests conducted by the National Cancer Institute show that male mice fed 2339 mg/kg body weight of trichloroethylene developed liver cancer. At this high dose, the incidence of cancer was 65%; at half-doses, it was 52%. Inconclusive results are reported from rat studies. Although these final results provide support for NCI's "memorandum of alert" published last year, NCI cautions users aginst rushing to substitute chemicals for trichloroethylene that have not been tested for carcinogenicity.

Iammartino, Nicholas R.
U.S. SHALE-OIL DEVELOPERS HOPE TO TAP GOVERNMENT FUNDS
Chem. Eng. 83 (7): 69-72 (29 March 1976)

Financial status, technical progress, and related factors are reviewed for 12 U.S. shale-oil projects and/or sponsoring firms.

See: 43-0014, Fluorocarbons

43-0030
VINYL CHLORIDE

Anon
BIRTH DEFECTS: VINYL CHLORIDE SUSPECTED
Chem. Eng. News 54 (11): 7 (15 March 1976)

A community-based study will be conducted (via interviews) in Charleston, W. Virginia, to determine the possible genetic effects on workers and nonworkers of vinyl chloride. As in Painesville, Ohio, Charleston has plants producing both vinyl chloride and polyvinyl chloride. An earlier hospital-based study in Painesville failed to confirm the previous findings of the Ohio Dept. of Health that suggested that vinyl chloride caused central nervous system malformations in infants born to parents who had been exposed to vinyl chloride.

43-0031
VINYL CHLORIDE

Anon
CDC CONDUCTING BIRTH DEFECTS STUDY NEAR UNION CARBIDE VCM PLANT
Occup. Health Saf. Lett. 6 (6): 5 (22 March 1976)

In its planned epidemiological study of birth defects the Center for Disease Control will interview parents of all children in the area around Union Carbide's PVC plant in South Charleston, W. Virginia, to find out where they work and the distance of their homes from the plant during early pregnancy. Additionally, EPA and the American Public Health Association will also study the carcinogenic and birth defect rates possibly caused by VCM.

43-0032
VINYL CHLORIDE

Anon
FOURFOLD EXCESS OF LIVER-PANCREAS DEATHS REPORTED IN SWEDISH VC WORKERS
Occup. Health Saf. Lett. 6 (5): 5-6 (8 March 1976)

At the Symposium on Potential Environmental Health Hazards from Technological Hazards in Rubber and Plastics Industries, held at NIEHS in Research Triangle Park, N.C., on 1-3 March 1976, Dr. Anders Englund of Stockholm reported that 12 of 58 deceased vinyl chloride or PVC workers in Sweden died from cancer, and that 4 of these deaths were from cancer of the liver or pancreas. One speaker, Dr. H. Antweiler, University of Dusseldorf, Germany, discussed a study that suggests chloroacetaldehyde as the carcinogenic metabolite of vinyl chloride. Dr. M. Saric of Zagreb, Yugoslavia, reported two cases of liver cancer in the PVC industry and a high incidence of lung and liver tumors among cement and asbestos cement workers.

43-0033
VINYL CHLORIDE

Dodson, B. and McNeill, I.C.
DEGRADATION OF POLYMER MIXTURES. VI. BLENDS OF POLY(VINYL CHLORIDE) WITH POLYSTYRENE
J. Polym. Sci., Polym. Chem. Ed. 14 (2): 353-64 (1976)

Thermal degradation behavior of PVC and polystyrene in the mixed and unmixed states was studied and mechanisms of possible interactions are discussed.

See: 43-0002, Acrylonitrile

See: 43-0015, Haloethers

43-0034
NITROSAMINES

Sen, Nrisinha et al
INHIBITION OF NITROSAMINE FORMATION IN FRIED BACON BY PROPYL GALLATE AND L-ASCORBYL PALMITATE
J. Agric. Food Chem. 24 (2): 397-401 (March-April 1976)

Although nitrosopyrrolidine (NPy) has not been identified in uncooked bacon, traces of NPy have been detected in fried bacon, probably as the result of the decarboxylation of nitrosoproline or from the direct action of pyrrolidine and the nitrite added to treat the meat. The potential carcinogenicity of many N-nitrosamines indicates the need to reduce the possible formation of such compounds in treated meats.

When normal nitrite-cured bacon was pretreated with 1000 ppm of propyl gallate, piperazine, sodium ascorbate, or ascorbyl palmitate, the formation of NPy was reduced significantly.

43-0035
NITROSAMINES

Suzuki, Norio and Okada, S.
ISOLATION OF NUTRIENT DEFICIENT MUTANTS AND QUANTITATIVE MUTATION ASSAY BY REVERSION OF ALANINE-REQUIRING L5178Y CELLS
Mutat. Res. 34 (3): 489-505 (1976)

A quantitative mutation assay system using nutrient deficient markers was developed and applied to such mutagens as N-methyl-N'-nitro-N-nitrosoguanidine (MNNG), 4-nitroquinoline-1-oxide, UV, and γ-rays. Dose response curves of the survival and of the induced mutation after treatment show the survival curves of MNNG treated cells to be exponential with drug concentration and mutation frequency to be linearly related to concentration within dose ranges tested.

Morrow, John et al
MUTAGENESIS STUDIES ON CULTURED MAMMALIAN CELLS. THE SENSITIVITY OF THE ASPARAGINE-REQUIRING PHENOTYPE TO SEVERAL CHEMICAL AGENTS
Mutat. Res. 34 (3): 481-8 (1976)

The mutagenic effects of N-methyl-N'-nitro-N-nitrosoguanidine (MNNG), ethylmethane sulfonate (EMS), and quinacrine HCl were compared by measuring the mutation frequency from asparagine dependence to asparagine independence in Jensen sarcoma cells. EMS was the most potent mutagen, yielding an exponential increase in the frequency of clones able to grow without asparagine. MNNG was a weak mutagen, yielding only modest increases. Quinocrine HCl caused no change in the mutation frequency. Apparently, MNNG does not act on mammalian cells in culture in the same way that it acts on bacteria.

43-0037
GENERAL INFORMATION

Anon
3M ENTERS FARM MARKET WITH NEW HERBICIDE
Chem. Eng. News 54 (12): 22-3 (22 March 1976)

Destun cotton herbicide, now available from 3M, is a pre-emergence, surface-applied compound for control of nutsedge, one of the major weed problems for cotton growers. Destun also controls teaweed, Johnson grass and other weeds.

Commonly known as perfluidone, Destun is identified chemically as 1,1,1-trifluoro-N-[2-methyl-4-(phenylsulfonyl)phenyl]methanesulfonamide. Pure perfluidone, a white solid, melts at 142-144°C, is acidic, and stable to heat and moisture.

43-0038
GENERAL INFORMATION

Anon
NEW ALARM OVER PESTICIDE KEPONE
Chem. Eng. 83 (6): 48 (15 March 1976)

Latest word from the EPA in the Kepone scenario is the finding of from 1 to 5.8 ppb of the pesticide in mothers' milk in Georgia, Alabama, and N. Carolina. No traces of Kepone were detected in samples collected in six other southern states.

43-0039
GENERAL INFORMATION

Hammond, Allen L.
LITHIUM: WILL SHORT SUPPLY CONSTRAIN ENERGY TECHNOLOGIES?
Science 191 (4231): 1037-8 (12 March 1976)

At a symposium on U.S. lithium resources and requirements by the 2000 sponsored by the U.S. Geological Survey at Golden, Colorado, on 22-24 Jan. 1976, the question of whether there are sufficient lithium resources to meet potential demands was debated. The projected need for lithium-sulfur batteries for automobile and electric utility applications might call for over 1 billion kilograms of lithium, an amount that exceeds one estimate of known resources available by the year 2000.

43-0040
GENERAL INFORMATION

Schroeder, Henry A.
TRACE ELEMENTS IN THE HUMAN ENVIRONMENT. PART I.
NYS Environ. 5 (9): 1, 10 (March 1976)

In testimony submitted to the U.S. Senate Subcommittee on Environmental Pollution in 1970, Dr. Schroeder reviewed the health aspects of trace elements in our environment. Twenty-two of the possibly 27 trace metals found in air are not considered health hazards at their present levels; 5 trace metals are potential health hazards and the concentration of one has not yet been measured. Cadmium, lead, and nickel carbonyl from diesel fuel need to be brought under control. Beryllium, found in 9 urban and 4 non-urban areas, can cause lung cancer. Antimony, found in 7 areas, has been found to shorten the rat's life span, when given in low doses. Mercury in air, however, is considered less of a hazard than mercury in water.

44-0001
ARSENIC

Pierce, F.D. and Brown, H.R.
INORGANIC INTERFERENCE STUDY OF AUTOMATED ARSENIC AND SELENIUM DETERMINATION WITH ATOMIC ABSORPTION SPECTROMETRY
Anal. Chem. 48 (4): 693-5 (1976)

Pollution-monitoring laboratories are more and more adopting automated techniques for analysis of metallic pollutants in surface waters, but earlier researchers have found that interference of certain pollutants hinder accurate analyses. This study shows that certain anions and cations interfere with the analysis of arsenic and selenium in the technique that uses reduction to hydrides and combustion by a tube furnace in the light path of an atomic absorption spectrophotometer. Results indicated that the sample cup composition material also affects accuracy.

44-0002
ARSENIC

Watson, Annetta P. et al
TOXICITY OF ORGANIC AND INORGANIC ARSENICALS TO AN INSECT HERBIVORE
Environ. Sci. Technol. 10 (4): 356-9 (1976)

The effects of two inorganic arsenic compounds (arsenic trioxide and pentoxide) and two organic arsenicals (cacodylic acid and cacodylic acid plus sodium cacodylate) were studied on a nontarget animal species, *Conocephalus fasciatus* nymphs.

LD_{50} values derived from analysis of the 7- and 14-day mortality data show the inorganic arsenicals to be more toxic than the organics. Arsenic trioxide was the most lethal of the compounds tested. The high whole-body arsenic concentration (715 ppm in carcasses of meadow katydids exposed to a 14-day chronic dose of 1500 ppm of cacodylic acid plus sodium cacodylate) suggests that large amounts of arsenic could be introduced into food chains when herbivores ingest contaminated vegetation.

44-0003
ASBESTOS

Hahon, Nicholas and Eckert, Herbert L.
DEPRESSION OF VIRAL INTERFERON INDUCTION IN CELL MONOLAYERS BY ASBESTOS FIBERS
Environ. Res. 11 (1): 52-65 (February 1976)

The effects of asbestos fibers (amosite, crocidolite, anthrophyllite, Canadian and Rhodesian chrysotile) on the induction of interferon by influenza virus was studied in monkey kidney cell monolayers. The results indicate that at concentrations of 1 mg/1.0 x 10^7 cells asbestos fibers depress interferon production by approximately 90%. The reduction of cellular protein synthesis by asbestos fibers indicates a selective cytotoxic effect on a specific cell function. The particular mechanism is not yet understood.

44-0004
ASBESTOS

Richards, R.J. and Jacoby, F.
LIGHT MICROSCOPE STUDIES ON THE EFFECTS OF CHRYSOTILE ASBESTOS AND FIBER GLASS ON THE MORPHOLOGY AND RETICULIN FORMATION OF CULTURED LUNG FIBROBLASTS
Environ. Res. 11 (1): 112-21 (February 1976)

Rabbit lung fibroblasts were exposed to two fibrous dusts (chrysotile asbestos and fiber glass) and observations were made on nuclear and cytoplasmic effects, cell proliferation, and the character of reticular (collagen) fibers that were formed.

Both dusts induced morphological changes and alterations in reticulin deposition, but in different degrees. The asbestos, however, was much more cytotoxic than fiber glass.

44-0005
ASBESTOS

Solomon, A. and Webster, I.
THE VISCERAL PLEURA IN ASBESTOSIS
Environ. Res. 11 (1): 128-34 (February 1976)

Routine chest radiographs showed fissural thickening and other lung changes in 13 asbestosis patients who had been exposed to asbestos continuously or fairly continuously over a 2 to 30 year period, but showed no visceral pleural change in 72 management personnel who had been exposed intermittently to asbestos over a 3 to 30-year period.

44-0006
ASBESTOS

Spivey, Charles, Jr. et al
TYLER ASBESTOS WORKERS PROGRAM. A PROSPECTIVE STUDY IN ENVIRONMENTAL LUNG DISEASE.
Abstract of Paper to be Presented at the Ann. Mtg. of the Am. Lung Assoc. and the Am. Thoracic Soc. New Orleans, La., 16-19 May 1976
in: Am. Rev. Respir. Dis. 113 (4): 84 (1976)

Since 1974 doctors at the East Texas Chest Hospital, Tyler, Texas, have been studying 890 persons, 85% of whom were cigarette smokers, who worked between 1954 and 1972 at a nearby asbestos plant. According to sputum cytology studies about 55% of the asbestos workers show some degree of atypia, which is also evident, however, in a similar percentage of controls. Both groups contain many who are smokers. Ferruginous bodies have been found in the sputum of 35% of the asbestos workers; several workers have died from lung cancer. In three cases, sputum cytology was the means of diagnosing the malignancy and the use of sputum cytology as a diagnostic tool is under evaluation.

Rom, W. et al
CHANGES IN PULMONARY FUNCTION IN HOUSEHOLD CONTACTS OF ASBESTOS WORKERS
Abstract of Paper to be Presented at the Ann. Mtg. of the Am. Lung Assoc.
and the Am. Thoracic Soc. New Orleans, La., 16-19 May 1976
In: Am. Rev. Respir. Dis. 113 (4): 88 (1976)

Over 200 household contacts of former asbestos factory workers have been examined for pulmonary function changes. Functional impairment has been found in almost 40% and about 13% were found to have reduced vital capacity. Smokers and ex-smokers showed a higher percentage (65.2%) of abnormal pulmonary function and 34.2% had abnormal chest x-rays.

44-0008
ASBESTOS

Lebowitz, M.D.
OCCUPATIONAL EXPOSURES IN RELATION TO SYMPTOMATOLOGY AND LUNG FUNCTION IN A COMMUNITY POPULATION
Abstract of Paper to be Presented at the Ann. Mtg. of the Am. Lung Assoc. and the Am. Thoracic Soc. New Orleans, La., 16-19 May 1976)
In: Am. Rev. Respir. Dis. 113 (4): 93 (1976)

Over 60% of the men in this general community population study were exposed to a potentially harmful substance or worked in a potentially hazardous industry. Higher rates of symptomatology and lung function impairment were noted in those exposed to particular substances, e.g., asbestos, silica, auto exhaust.

Frith, Charles H. and Dooley, Kenneth
HEPATIC CYTOLOGIC AND NEOPLASTIC CHANGES IN MICE GIVEN BENZIDINE DIHYDROCHLORIDE
J. Nat. Cancer Inst. 56 (3): 679-82 (1976)

Mice given benzidine dihydrochloride (0, 50, 150, 300 and 500 ppm) in their drinking water for 39 weeks experienced hemosiderosis of the spleen, focal vacuolization of the transitional epithelium of the urinary bladder, and liver damage. In addition to chronic inflammation of the liver, the mice showed focal hepatocellular cytologic changes and developed benign and malignant liver tumors, the latter being more common in the females.

Pierce, F.D. and Brown, H.R.
MICROGRAM DETERMINATION OF BORON IN SURFACE WATERS BY ATOMIC EMISSION SPECTROMETRY
Anal. Chem. 48 (4): 670-3 (1976)

The semiautomated technique described for analyzing boron in surface water by atomic emission spectrometry has a detection limit and sensitivity of 0.002 mg/l and 0.004 mg/l boron, respectively.

Fries, G.F. et al
RETENTION AND EXCRETION OF POLYBROMINATED BIPHENYLS BY HENS
Bull. Environ. Contam. Toxicol. 15 (3): 278-82 (1976)

Hens were fed for 63 days on a diet containing 20 ppm polybrominated biphenyls (PBB), identified as a complex mixture containing one hexa and one hepta component. Hens examined at the end of the 63-day diet showed a higher concentration of PBB in their body fat (79.8 ± 11.1 ppm hexa and 31.4 ± 10.5 ppm hepta) than did hens examined 49 days after the PBB diet was stopped (68.9 ± 12.2 ppm hexa and 25.1 ± 12.4 ppm hepta). A higher concentration of PBB was also found in eggs at 63 days than was found 49 days later. Concentrations of PBB residues in excreta rose to 3+ ppm initially, then declined and levelled off to about 2 ppm on a wet basis during the 63-day diet period, but dropped to less than 0.1 ppm after PBB was removed from the diet.

44-0012
FLUOROCARBONS

Anon
CHLOROFLUOROMETHANES CITED AS THE ONLY THREAT TO STRATOSPHERIC OZONE
Chem. Week 118 (14): 10 (7 April 1976)

According to the federal Interagency Task Force on Inadvertent Modification of the Stratosphere, only chlorofluoromethanes now pose a threat to the ozone layer. Nitrogen fertilizers, brominated compounds, chlorinated compounds other than the chlorofluoromethanes, particulates, space vehicle emissions, and the CO from automobile exhaust apparently do not pose an "immediate serious problem," primarily because the compounds of concern have not yet been released to the stratosphere in quantity.

44-0013
FLUOROCARBONS

Precision Valve Corp.
DON'T GIVE UP ON FLUOROCARBON AEROSOLS...YET!!!
Soap, Cosmet. Chem. Spec. 52 (3): 101 (1976)

In an advertisement, Precision Valve Corp. casts doubts on the ozone depletion theory, basing its comments on the results of a study conducted for the company by EcoSystems, Inc., McLean, Va. In this study, EcoSystems examined ozone measurements made from 1926 through 1974 at Arosa, Switzerland, and found no evidence of a change or reduction in ozone attributable to man's activities. Additionally, data collected from 1957-1974 by the World Ozone Data Center, Toronto, Canada, show an upward trend of total hemispheric ozone since 1964.

Carbon tetrachloride, which up to 1975 diffused more chlorine into the atmosphere than did fluorocarbons 11 and 12, reportedly caused no ozone depletion. Precision Valve sees the current concern as premature and urges completion of current fluorocarbon studies before any Government regulations are imposed.

44-0014
FLUOROCARBONS

Anon
FIGHT KY. FLUOROCARBON BAN
Soap, Cosmet. Chem. Spec. 52 (3): 111, 146 (1976)

Kentucky producers and users of fluorocarbon aerosol propellants argue against proposed ban on sales of some fluorocarbon products, effective 1 March 1978. Action by Kentucky would not have any significant impact on the predicted ozone depletion problem but would cause an undesirable economic impact in the state. Scientific arguments cited the uncertainty of current information on ozone depletion and emphasized that data from Toronto's World Ozone Center indicate an increase rather than a decrease in ozone levels.

44-0015
FLUOROCARBONS

Swift, D.L. et al
RESPIRATORY DEPOSITION OF HAIRSPRAY AEROSOL AND ACUTE LUNG FUNCTION CHANGES
Abstract of Paper to be Presented at the Ann. Mtg. of the Am. Lung Assoc.
and the Am. Thoracic Soc. New Orleans, La., 16-19 May 1976
in: Am. Rev. Respir. Dis. 113 (4): 96 (1976)

Hair spray aerosol with a mass median diameter of 7.8 micrometers and a geometric standard deviation of 2.0 was inhaled by mouth and nose by 9 nonsmoking persons. An average decrease of 16% for mouth breathing and 10% for nose breathing was noted in the expiratory flow rate at 40% vital capacity. Cough, excessive mucus, chest tightness and other symptoms were more evident and more persistent after mouth breathing than after nose breathing.

44-0016
FLUOROCARBONS

Cohen, Burton M.
PERIPHERAL AIRWAY RESPONSES TO ACUTE HAIR-SPRAY EXPOSURE
Abstract of Paper to be Presented at the Ann. Mtg. of the Am. Lung Assoc.
and the Am. Thoracic Soc. New Orleans, La., 16-19 May 1976
in: Am. Rev. Respir. Dis. 113 (4): 123 (1976)

Data calculated from the maximum expiratory flow-volume curves of 30 normal adults exposed to a 20-second application of a commercial hair spray during normal breathing showed no immediate changes in small airway function resulting from exposures higher than those recommended for commercial hair spray application.

44-0017
FLUOROCARBONS

Chang, Louis W. et al
PATHOLOGICAL CHANGES IN THE NERVOUS SYSTEM FOLLOWING IN UTERO EXPOSURE TO HALOTHANE
Environ. Res. 11 (1): 40-51 (February 1976)

Because previous studies suggest that the anesthetic agent, halothane, may be hazardous to pregnant operating room personnel, pregnant rats were exposed to 10 ppm halothane for 8 hr/day, 5 days/wk during pregnancy. Electron microscope examination of tissue samples from the cerebral cortex of neonatal pups and pups allowed to mature for 100 days showed significant pathological changes, such as weakening of the nuclear envelope of many neurons in the neonatal animals and vacuolation of the Golgi complex of the neurons in both neonatal and mature pups.

44-0018
HALOETHERS

Frankel, L.S. and Black, R.F.
AUTOMATIC GAS CHROMATOGRAPHIC MONITOR FOR THE DETERMINATION OF PARTS-PER-BILLION LEVELS OF BIS(CHLOROMETHYL) ETHER
Anal. Chem. 48 (4): 732-7 (1976)

The described automatic monitor, capable of selectively measuring 0.1 ppb of bis(chloromethyl) ether in air, can analyze 8 different sample locations yielding 48 data points/day. Reported results indicate that this monitor could serve for the detection of most organic pollutants in air at the ppb level.

44-0019
HALOETHERS

Weiss, William
THE END-EXPIRATORY FLOW RATE IN MEN EXPOSED TO CHLOROMETHYL ETHERS
Abstract of Paper to be Presented at the Ann. Mtg. of the Am. Lung Assoc. and the Am. Thoracic Soc. New Orleans, La., 16-19 May 1976
In: Am. Rev. Respir. Dis. 113 (4): 83 (1976)

A pulmonary screening study of 103 chemical workers, 72 of whom had been exposed in varying degrees to chloromethyl ethers, showed no difference between expiratory volume of exposed and unexposed subjects. Comparison of their end-expiratory flow rate (EEFR) with normal values for EEFR recently published showed that 33-38% of the men exposed to chloromethyl ethers had EEFR below 60% compared to only 3% of those not exposed. Apparently, small airway disease in persons exposed to these haloethers is dose-related.

Weiss, William
THE CHARACTERISTICS OF LUNG CANCER DUE TO CHLOROMETHYL ETHERS
Abstract of Paper to be Presented at the Ann. Mtg. of the Am. Lung Assoc. and the Am. Thoracic Soc. New Orleans, La., 16-19 May 1976
In: Am. Rev. Respir. Dis. 113 (4): 84 (1976)

Chloromethyl ethers induced lung cancer in 11 of 91 persons exposed to the chemicals, according to a 10-year prospective study of 125 chemical workers. These small-cell type lung cancers did not respond to treatment and all 11 died 2-24 months after the cancer was detected. Induction period for lung cancer development varies with the length and degree of exposure.

MacEwen, J.D. and Vernot, E.H.
TOXIC HAZARDS RESEARCH UNIT ANNUAL TECHNICAL REPORT: 1975
AD-A019 456. Calif. Univ. Irvine (October 1975)

The research programs of the Toxic Hazards Research Unit (THRU) for the period of June 1974 through May 1975 are reviewed in this report. Acute toxicity experiments were conducted on SYFO, FEFO, hydrazine, MMH and UDMH. Chronic toxicity experiments were conducted with MMH in drinking water, coal tar aerosols, inhaled UDMH and with a mixture of dichloromethane and 1,1,1-trichloroethane. Oral and percutaneous toxicity determinations and skin irritation and skin sensitization studies were made on a number of transportable chemical agents. (Author)

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 129 (23 February 1976)]

44-0022
ISOCYANATES

Gunter, Bobby J. and Lucas, James B.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION REPORT H.H.E. 74-73-233, Gates Rubber Company, Denver, Colorado
PB-249 413. NIOSH-TR-HHE-74-73-233 (Nov. 1975)

A company producing high quality urethane tracks for snowmobiles was investigated by NIOSH. Employees were allegedly exposed to 4,4'-methylene bis(2 chloraniline) (MOCA) and toluene 2,4-diisocyanate during equipment cleaning. Based on environmental measurements, medical interviews, observation of work practices, and a review of literature pertaining to the toxicity of these two compounds, it was determined that a potential health hazard did exist at the time of the evaluation. Since MOCA is a suspected carcinogen, any exposure to it is regarded as potentially hazardous.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 236 (5 April 1976)]

44-0023
ISOCYANATES

Gunter, Bobby J. and Lucas, James B.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION REPORT H.H.E. 74-73-232 Gates Rubber Company, Denver, Colorado
PB-249 412. NIOSH-TR-HHE-74-61-232 (Nov. 1975)

A plant manufacturing extruded hose, principally from the extrusion of polyvinyl chloride, was investigated by NIOSH to evaluate employee exposures to cyclohexanone, TDI, trichloroethylene, Estane thermoplastic polyurethane, methylene chloride, Nigrosine, Di-2-ethyl hexyl phthalate (DOP oil), dust, and vinyl chloride. It was determined that a potential health hazard may exist from exposure to cyclohexanone, and that several cases of primary irritant dermatitis had occurred following repeated exposure to solvents. Although only one of 38 vinyl chloride samples was found to exceed the Federal Standard action level, it was recommended that airborne concentrations be reduced to levels not detected by the recommended analytical techniques.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 236 (5 April 1976)]

See: 44-0022, Isocyanates

See also: 44-0031, Vinyl Chloride

Dilling, Wendell L. et al
SIMULATED ATMOSPHERIC PHOTODECOMPOSITION RATES OF METHYLENE CHLORIDE, 1,1,1-TRICHLOROETHANE, TRICHLOROETHYLENE, TETRACHLOROETHYLENE, AND OTHER COMPOUNDS
Environ. Sci. Technol. 10 (4): 351-6 (1976)

The results of laboratory studies on the photolysis rates of 10 chlorohydrocarbons and 23 other organic compounds under simulated atmospheric conditions are presented. Moderate decomposition rates (est. half-lives of 5 to 12 hr.) in the presence of nitric oxide were recorded for vinylidene chloride, trichloroethylene, and vinyl chloride; slow decomposition (est. half-lives of 20-40 hr) is reported for tetrachloroethylene.

See: 44-0023, Isocyanates

44-0025
POLYURETHANES

Lawrence, John and Tosine, Helle M.
ADSORPTION OF POLYCHLORINATED BIPHENYLS FROM AQUEOUS SOLUTIONS AND SEWAGE
Environ. Sci. Technol. 10 (4): 381-3 (1976)

Adsorption data for PCB's (Aroclor 1254 and 1242) on several activated carbons, two polymeric resins, two polyurethane foams and PVC are presented. The activated carbons, a polymeric resin, and the polyurethane foams were effective adsorbents for PCB's from synthetic aqueous solutions but not for PCB's in raw sewage. The best adsorbent for the raw sewage PCB's was PVC.

44-0026
POLYURETHANES

Anon
URETHANE USE EXPECTED TO RISE 15% IN 1976
Chem. Week 118 (15): 32 (14 April 1976)

Upjohn's Polymer Chemicals Division predicts an approximate 15% increase in 1976 demand for urethane materials with the total expected to rise from the 1975 figure of 1.41 billion lbs to 1.61 billion lbs. Biggest end-use market is expected to be transportation.

Anon
STORY CHEMICAL'S NEW THERMOPLASTIC-THERMOSET IS BASED ON POLYURETHANES
Chem. Week 118 (15): 36 (14 April 1976)

Story Chemical holds U.S. Pat. 3,947,426 issued on the composition and structure of new polymers based on polyurethanes. The new materials, thermoplastic up to a certain temperature beyond which they become thermosetting, will be promoted as adhesives and polymer reinforcing materials.

POLYURETHANES

See: 44-0022, Isocyanates

See: 44-0023, Isocyanates

See: 44-0023, Isocyanates

See: 44-0024, Perchloroethylene

Landau, Emanuel et al
EPIDEMIOLOGY STUDIES. TASK III. VINYL CHLORIDE
PB-248 426. Am. Pub. Health Assoc. EPA/560/6-75/002 (Nov. 1975)

Using data from the 1970 Census of Population estimates of the number of people living within a 5 mile radius of industrial plants producing vinyl chloride and vinyl chloride resins was prepared. Findings are reported. The sex, and age characteristics are provided.
[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 128 (23 February 1976)]

44-0029
VINYL CHLORIDE

Anon
PREDICTING BEHAVIOR OF CHEMICALS IN THE ENVIRONMENT....
Chem. Eng. News 54 (14): 14 (5 April 1976)

A computer model developed by EPA to determine the risk from vinyl chloride is seen as potentially useful in predicting movement, chemical action, and fate of other environmental pollutants.

44-0030
VINYL CHLORIDE

Serravallo, F.A. and Risby, T.H.
DIRECT INJECTION OF GASEOUS SAMPLES INTO A MICROWAVE INDUCED DISCHARGE
Anal. Chem. 48 (4): 673-6 (1976)

The use of microwave-induced discharges for monitoring air pollutants is feasible if oxygen and nitrogen are first separated from the pollutants by gas chromatography. Results of the analysis of vinyl chloride in air samples are discussed.

44-0031
VINYL CHLORIDE

Hill, James, IV et al
DYNAMIC BEHAVIOR OF VINYL CHLORIDE IN AQUATIC ECOSYSTEMS
PB-249 302. EPA/600/3-76/001 (January 1976)

To evaluate the behavior of vinyl chloride in aquatic ecosystems, best estimate and worst case models of lake and stream ecosystems were analyzed through the use of mathematical simulation. The characteristics of the chemical, biological and physical transformations of vinyl chloride indicated in the models were determined by laboratory experimentation and extrapolation of reaction data for similar compounds. These transformations included oxidation, substitution, elimination, hydrolysis, and free radical reactions; complexation; direct and indirect photochemical reactions; microbial degradation and toxicity; bacterial, algal, and fungal sorption; and volatilization. Loss of vinyl chloride from the aquatic environment by volatilization appeared to be the most significant process in its distribution.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 228 (5 April 1976)]

44-0032
VINYL CHLORIDE

EPA
SCIENTIFIC AND TECHNICAL ASSESSMENT REPORT ON VINYL CHLORIDE AND POLYVINYL CHLORIDE
PB-249 461. EPA/600/6-75/004 (December 1975)

Vinyl chloride (VC) is a chemical of widespread industrial and commercial use. Occupational experience and experimental evidence strongly indicate that it is a carcinogen. Additionally, there is experimental evidence that indicates that it may be a teratogen and mutagen. An increased incidence of liver angiosarcoma, excessive liver damage, and acroosteolysis has been reported among VC workers, and the frequency and severity of the liver pathology is related to the length of exposure. The principal route of exposure is thought to be air inhalation. Sources of increased importance for the general population include food and water. Tumors at multiple and diverse sites have been observed in all species of experimental animals tested for carcinogenicity by inhalation and ingestion of VC. In addition to the health effects of VC, this document also considers the sources, distribution and control technology.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 222 (29 March 1976)]

44-0033
VINYL CHLORIDE

Wimer, W.E. and Feathers, R.E.
OXYGEN GIVES LOW COST VCM
Hydrocarbon Process. 55 (3): 81-4 (1976)

As part of a special report on commercial oxidation processes, this paper addresses the difference between using air or oxygen in the oxychlorination processing step of the balanced oxychlorination vinyl chloride monomer process. The authors opt for oxygen, which allows elimination of the nitrogen diluent in the process vent and reduces vent volume by a factor of 100. Another advantage is that oxygen can reduce the environmental impact.

See: 44-0024, Perchloroethylene

Reich, Peter
AIR OR OXYGEN FOR VCM?
Hydrocarbon Process. 55 (3): 85-9 (1976)

Contributing to a special report on commercial oxidation processes, this paper acknowledges the economic and environmental advantages of using oxygen rather than air in the oxychlorination VCM process, but indicates that conversion of existing plants might be too costly, if done merely to meet environmental regulations.

VINYL CHLORIDE

See: 44-0023, Isocyanates

See: 44-0024, Perchloroethylene

See: 44-0025, Polyurethanes

44-0035
NITROSAMINES

Aldridge, W.N.
N-NITROSO COMPOUNDS IN THE ENVIRONMENT. PROCEEDINGS OF A WORKING CONFERENCE HELD AT THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER, LYON, 1973 IARC SCIENTIFIC PUBLICATION No. 9 (1975)
Br. J. Cancer 33 (2): 235 (1975)

The author reviews this IARC volume, which contains three sections on N-nitroso compounds covering their analysis, formation, and presence in the environment. While acknowledging the potential usefulness of the information as a means of helping to reach an understanding of environmental nitrites and nitrates as they may lead to formation of carcinogenic nitrosamines, the reviewer suggests that the information is likely out-of-date already in this rapidly advancing field.

44-0036
NITROSAMINES

Wolfe, N. Lee et al
N-NITROSAMINE FORMATION FROM ATRAZINE
Bull. Environ. Contam. Toxicol. 15 (3): 342-7 (1976)

Because atrazine and other triazine herbicides have been detected in U.S. drinking waters at several locations, a preliminary report on the N-nitrosation of atrazine is presented. To date, one of three possible products of the reaction has been isolated. This is the 2-chloro-4-(N-nitroso-N-ethylamino)-6-isopropylamino-s-triazine (NNA), which has hydrolytic stability but decomposes rapidly by light. NNA would probably be formed in the soil and could then be leached into ground waters.

Rahman, Mohammed T. et al
NITROSO COMPOUNDS I. THE REACTION OF PHENYLCOPPER REAGENTS WITH NITROSAMINES. (CLEAVAGE OF THE N-N BOND)
Tetrahedron Lett. (12): 959-62 (March 1976)

Current interest in nitrosamines as carcinogens, chemotherapeutics and organic synthesis agents led to this study of the reactions of nitrosamines with organo-metallic reagents.

44-0038
GENERAL INFORMATION

Vigliani, E.C. and Forni, Alessandra
BENZENE AND LEUKEMIA
Environ. Res. 11 (1): 122-7 (February 1976)

At least 150 cases of leukemia attributable to benzene are known. Analysis of the types of leukemia induced, possible risks, and mechanisms of benzene action are discussed.

44-0039
GENERAL INFORMATION

Anon
RUBBER INDUSTRY TO BACK BUTADIENE TOXICITY STUDY
Chem. Week 118 (14): 9 (7 April 1976)

Butadiene may be a potential health hazard in the tire and rubber industry and so studies of its toxic and metabolic effects will be sponsored by the International Institute of Synthetic Rubber Producers. Other possible areas of concern to these industries are the possible induction of leukemia by solvents and lung cancer by tire-curing fumes.

44-0040
GENERAL INFORMATION

Anon
MORE LEUKEMIA CASES
Chem. Week 118 (14): 17 (7 April 1976)

NIOSH is currently investigating possible leukemia deaths among employees of various synthetic rubber plants in Port Neches, Texas. Deaths from leukemia of several B.F. Goodrich styrene-butadiene rubber workers and a few workers at Texas - U.S. Chemical's synthetic rubber plant prompted this latest survey. As yet, the rubber chemicals have not been linked directly to the induction of leukemia.

44-0041
GENERAL INFORMATION

Anon
SELF-DESTRUCT PLASTICS READY FOR MARKET
Chem. Week 118 (14): 35-6 (7 April 1976)

Polyolefins with special UV-light sensitizers and starch-based formulas that promote eventual biodegradation find their best current market as trash bags. One such commercially available product from Ampacet Corp., Mt. Vernon, N.Y., contains a special color concentrate that provides photodegradability.

45-0001
ASBESTOS

U.S. Department of Labor, Occupational Safety and Health Administration
STANDARDS FOR EXPOSURE TO ASBESTOS
Fed. Regist. 41 (55): 11504-05 (19 March 1976)

The exposure records provision of the asbestos standard is revised to require retention of exposure monitoring records for at least 20 years. A review of events prompting the revision is included.

45-0002
ASBESTOS

Skidmore, J.W. and Jones, J.S.P.
MONITORING AN ASBESTOS SPRAY PROCESS
Ann. Occup. Hyg. 18: 151-6 (1975)

Sprayed asbestos cement used in construction presents a greater hazard to workmen outside the immediate spray area and to those involved in clean-up operations than to the spray operators since the former are exposed to the asbestos without adequate respiratory protection.

45-0003
ASBESTOS

Toivanen, A. et al
PULMONARY ASBESTOSIS AND AUTOIMMUNITY
Br. Med. J. 1: 691-2 (20 March 1976)

Previous work had suggested that autoimmunity might be a factor in causing the pulmonary lesions of asbestosis. The authors studied men who had worked with asbestos from 2-38 years, none of whom suffered from severe asbestosis, and found no evidence for an autoimmune mechanism in the pathogenesis of the disease.

45-0004
ASBESTOS

Gibbs, G.W.
FIBRE RELEASE FROM ASBESTOS GARMENTS
Ann. Occup. Hyg. 18: 143-9 (1975)

Workers wearing asbestos safety garments may be exposed to airborne asbestos fibers released from the protective clothing. In this study, the concentrations of asbestos fibers (>5 μm) near the breathing zone of the workers were 0.3-5.0 fibers/cm^3 in one plant, and 9.9-26.2 fiber/cm^3 in a second plant. The higher concentrations at the second plant seem related to the un-treated asbestos protective clothing worn by workers in that plant. In 1/3 of the cases, the concentrations of airborne asbestos fibers exceeded the British Occupational Hygiene Society standard. The author recommends development of a treatment for asbestos garments to reduce release of asbestos fibers and limit exposure of workers to the hazard.

Balaam, L.N. and McCullagh, S.F.
VITAL CAPACITY AND ONE-SECOND FORCED EXPIRATORY VOLUME IN AUSTRALIAN MALE ASBESTOS CEMENT WORKERS
Ann. Occup. Hyg. 18: 133-141 (1975)

The authors studied the effects of exposure to asbestos on vital capacity (VC) and one-second forced expiratory volume (FEV) in approximately 1000 men working in asbestos-cement products factories. Their conclusion is that asbestos exposure in this industry has a considerable effect on VC and FEV which increases with years of exposure.

Carter, L.J.
MICHIGAN'S PBB INCIDENT: CHEMICAL MIX-UP LEADS TO DISASTER
Science 192 (4236): 240-3 (16 April 1976)

The author reviews events leading up to and following the mix-up at a chemical plant of the fire-retardant, PBB, and a compound used to sweeten acidic cattle feeds. The PBB was accidentally mixed into the feeds and sold and distributed to Michigan farmers. The various lawsuits as well as the severe impact on the farm economy of Michigan are discussed. The short- and long-term effects of PBB on humans and animals are now under investigation.

45-0007
FLAME RETARDANTS

Harbison, R.D. et al
A PROPOSED MECHANISM FOR TRIMETHYLPHOSPHATE-INDUCED STERILITY
Toxicol. Appl. Pharmacol. 35 (3): 481-90 (1976)

Trimethylphosphate (TMP) is used as a flame retardant solvent for paints and polymers. Depending on dose of TMP and duration of treatment, the authors demonstrated sterility in mouse, rat, and rabbit within 1-2 weeks after initial exposure to TMP. In all cases, the sterility was reversible upon cessation of the TMP exposure.

45-0008
FLAME RETARDANTS

Anon
NADER RAPS FLAME TREATED SLEEPWEAR
Text. World 126 (4): 24 (April 1976)

Polyester fabrics used for children's sleepwear are treated with tris (2,3-dibromopropyl) phosphate as a flame retardant. The chemical is suspected of being a carcinogen and Nader's group is urging the Consumer Products Safety Commission to alert consumer to the potential hazard.

45-0009
FLAME RETARDANTS

Anon
LeBLANC FLAMMABILITY SYMPOSIUM TO BE HELD APRIL 14-15
Am. Dyest. Rep. 65 (3): 62 (March 1976)

Notice of symposium and list of 15 papers to be presented on textile flammability and flame retardants in New York City on April 14-15 under sponsorship of LeBlanc Research Corporation.

45-0010
FLAME RETARDANTS

Anon
FLAME RETARDANT...
Chem. Eng. News 54 (18): 11 (26 April 1976)

A brief notice of Michigan Chemical's construction of an expanded facility including a multimillion-pound/year flame retardant complex. An early 1977 completion date is planned.

Anon
INTRODUCING THE OLIN 30,000,000 POUND FLAME RETARDANT COMMITMENT TO THE URETHANE MARKET
Chem. Week 118 (16): 12 (12 April 1976)

An advertisement describing Olin Chemicals' plant for producing polyol flame retardants for use in urethane foam formulations.

FLAME RETARDANTS

See: 45-0006, Brominated Biphenyls

45-0012
FLUOROCARBONS

Kennedy, G.L. et al
REPRODUCTIVE AND TERATOLOGIC STUDIES WITH HALOTHANE
Toxicol. Appl. Pharmacol. 35 (3): 467-74 (1976)

Male and female rats were exposed to halothane at anesthetic concentrations prior to mating and at various stages of fetal organogenesis. No adverse reproductive effects were noted, no teratogenic activity was obtained. The possibility of an effect on fetal survival in rats exposed late in pregnancy bears further study.

45-0013
FLUOROCARBONS

Krey, P.W. et al
STRATOSPHERIC CONCENTRATIONS OF CCl_3F IN 1974
J. Geophys. Res. 81 (9): 1557-60 (20 March 1976)

Distributions of CCl_3F concentrations were measured in the total stratosphere. According to the model used, a molecule of CCl_3F which is not decomposed in the stratosphere, can be returned to the troposphere, where it may remain for return to the stratosphere. The authors calculate the total atmospheric half-life of a single injection of CCl_3F to be 15-30 years.

45-0014
FLUOROCARBONS

Trochimowicz, H.J. et al
THE EFFECT OF MYOCARDIAL INFARCTION ON THE CARDIAC SENSITIZATION POTENTIAL OF CERTAIN HALOCARBONS
J. Occup. Med. 18 (1): 26-30 (January 1976)

After recovery from induced myocardial infarctions, dogs were exposed to methyl chloroform, fluorocarbon 11, and fluorocarbon 1301 to study the effect of the cardiac damage on cardiac sensitivity to halocarbons. The object of the study was to assess the potential for subsequent heart attacks in individuals (who have recovered from myocardial infarctions) returning to work in certain industries where they are exposed to halocarbons. The results of the experiments showed no greater cardiac sensitization in animals exposed to the halocarbons than in normal dogs.

The authors note limitations in extrapolating from this study to humans; e.g., the myocardial infarctions artificially-induced in young healthy dogs vs. those occurring in older, less healthy humans.

45-0015
FLUOROCARBONS

Wheater, R.H.
ARE THERE HAZARDS IN USE OF ETHER AS A SURGICAL CLEANSER FOR HOSPITAL PATIENTS?
J. Am. Med. Assoc. 235 (10): 1059 (8 March 1976)

Freon has been found to be a suitable substitute for diethyl ether as a skin cleaner in certain medical situations. The hazards associated with the use of ether are eliminated while the effectiveness of ether is retained.

45-0016
FLUOROCARBONS

Cox, R.A. et al
PHOTOCHEMICAL OXIDATION OF HALOCARBONS IN THE TROPOSPHERE
Atmos. Environ. 10 (4): 305-8 (1976)

The authors derive life-times of the halocarbons with respect to photooxidation in the troposphere based on the reactivity of hydroxyl radicals with the halocarbons. Those chlorohydrocarbons containing H atoms are found to be moderately reactive and have life-times of 1 yr. or less. Fully halogenated compounds, such as CCl_4 and Freons 11 and 12 are essentially inert to photooxidation and have estimated atmospheric residence times of 20 and 40 years respectively. An estimate of the size of the tropospheric sink for the halocarbons due to oxidation by OH radicals is made. In some cases (the more reactive halocarbons) this sink exceeds the estimated man-made sources and an additional, possibly natural, source is suggested.

45-0017
FLUOROCARBONS

Taylor, George J. and Drew, Robert T.
CARDIOMYOPATHY PREDISPOSES HAMSTERS TO TRICHLOROFLUOROMETHANE TOXICITY
Toxicol. Appl. Pharmacol. 32: 177-183 (1975)

The object of the study was to determine the effect of a preexisting heart disease on the response to F-11. After controlled exposure to F-11, cardiomyopathic (CMP) hamsters developed cardiac arrhythmias at lower inhaled F-11 concentrations than did the controls. Concentrations of F-11 which were tolerated by all other groups studied, resulted in death in CMP hamsters with congestive heart failure. The authors note the lack of correlation between human heart disease and the genetic cardiomyopathy of the hamsters in this study, but based on the results of their work, suggest the possibility of increased risk to patients with heart disease during use and especially abuse or misuse of aerosols.

Anon
OZONE DAMAGE OVERESTIMATED?
Chemistry 49 (4): 24 (May 1976)

The results of a study sponsored by the Manufacturing Chemists Association indicate that 80% or more of chlorofluorocarbons released into the atmosphere may be destroyed by natural processes before reaching the ozone layer. This study contradicts an earlier report published by the National Oceanographic and Atmospheric Administration and concludes that adverse atmospheric effects of aerosol propellants may have been overestimated by 500% or more.

Mendoza, C.E. and Shields, J.B.
EFFECTS OF HEXACHLOROBENZENE ON MALATHION LD50 AND ON CHOLINESTERASE AND CARBOXYLESTERASE ACTIVITIES IN ORGANS OF THE SUCKLING ALBINE RAT
Toxicol. Appl. Pharmacol. 35 (3): 447-53 (1976)

Female rats were fed hexachlorobenzene (HCB) and their pups were subjected to doses of malathion. Treatment with HCB increased the LD50 value for malathion in the pups by more than twice that for the controls. The authors suggest that the systems responsible for decreased malathion toxicity, i.e., chloinesterases and carboxylesterases, are increased following treatment with HCB.

45-0020
LIQUEFACTION AND GASIFICATION OF COAL

Anon
COMPETITIVE COAL GASIFICATION
Sci. News 109 (17): 266 (24 April 1976)

Report on paper presented at the recent American Chemical Society meeting in New York. The *in situ* technique developed by the Lawrence Livermore Laboratory, may be economically comparable to other coal gasification processes. The *in situ* technique avoids the dangers of deep mining and the environmentally disruptive effects of strip mining.

45-0021
LIQUEFACTION AND GASIFICATION OF COAL

Anon
HOUSE WEIGHS FINANCING FOR SYNTHETIC FUELS
Chem. Eng. News 54 (17): 15 (19 April 1976)

Review of opinions and witness testimony before Congressional hearings related to federal loan guarantees and subsidies for commercialization of synthetic fuels technology including coal gasification plant.

See: 45-0023, Model Ecosystems

See also: 45-0032, General Information

45-0022
MODEL ECOSYSTEMS

Patrick, F.M. and Loutit, Margaret
PASSAGE OF METALS IN EFFLUENTS, THROUGH BACTERIA TO HIGHER ORGANISMS
Water Res. 10 (3): 333-5 (1976)

Heavy metals from effluents can be concentrated by aquatic bacteria rather than dispersed, and thus can be passed up the food chain. Bacteria isolated from streams below wool dyeing and scouring plants and a sewage treatment plant were found to concentrate Ca, Cu, Mn, Fe. Pb, and Zn.

45-0023
MODEL ECOSYSTEMS

Pitter, P.
DETERMINATION OF BIOLOGICAL DEGRADABILITY OF ORGANIC SUBSTANCES
Water Res. 10 (3): 231-235 (1976)

The author tabulates the degradabilities of 123 organic compounds determined by experiments noting the decrease of organic substances relative to COD in a microbial innoculum. 1-Naphthylamine was one of the compounds studied.

Andersson, H.F. et al
PHOSGENE FORMATION DURING WELDING IN AIR CONTAMINATED WITH PERCHLOROETHYLENE
Ann. Occup. Hyg. 18: 129-31 (1975)

Electric arc welding performed in air containing perchloroethylene results in the production of phosgene. Previous work had shown phosgene formation in hazardous concentrations from welding in air containing non-hazardous concentrations of trichloroethylene or methylchloroform. However, the rate of phosgene formation from welding in perchloroethylene-contaminated air is much faster and since the rate of the lacrymatory warning agent is almost the same as that of phosgene, welding in perchloroethylene-containing atmospheres is very hazardous and should be avoided.

PERCHLOROETHYLENE

See also: 45-0025, Trichloroethylene

45-0025
TRICHLOROETHYLENE

Schwetz, B.A. et al
THE EFFECT OF MATERNALLY INHALED TRICHLOROETHYLENE, PERCHLOROETHYLENE, METHYL CHLOROFORM, AND METHYLENE CHLORIDE ON EMBRYONAL AND FETAL DEVELOPMENT IN MICE AND RATS
Toxicol. Appl. Pharmacol. 32: 84-96 (1975)

Pregnant animals were exposed to trichloroethylene at twice the maximum allowable excursion limit for industrial exposure of humans to study the effects of this chemical on the developing fetus and embryo. The results of this study showed no embryonal or fetal toxicity to trichloroethylene at the level tested. Similar results were noted with perchloroethylene.

45-0026
TRICHLOROETHYLENE

Vesterberg, Olof and Astrand, I.
EXPOSURE TO TRICHLOROETHYLENE MONITORED BY ANALYSIS OF METABOLITES IN BLOOD AND URINE
J. Occup. Med. 18 (4): 224-6 (April 1976)

Trichloroethylene (TRI) is metabolized to trichloroacetic acid (TCA) and trichloroethanol (TCE). TCA is considered of greater importance toxicologically than TRI and its other metabolites because it (TCA) effects the central nervous system and may lower the level of consciousness. In this study, healthy young men were exposed to TRI. TCE & TCA levels in blood and urine were measured at intervals during and after exposure. TCA & TCE were found in blood up to 4.5 hrs after exposure and in urine up to 22 hrs. after exposure. Based on their results, the authors suggest that measurement of TCA in urine may be the better indicator of exposure to TRI.

See: 45-0024, Perchloroethylene

45-0027
VINYL CHLORIDE

Falk, Henry and Portnoy, Benjamin
RESPIRATORY TRACT ILLNESS IN MEAT WRAPPERS
J. Am. Med. Assoc. 235 (9): 915-17 (1 March 1976)

The authors report the results of a survey designed to determine the prevalence of respiratory tract problems in meat wrappers in supermarkets using polyvinyl chloride film wrap and hot wire cutters. The survey showed that meat wrappers had increased multiple respiratory tract symptoms compared to control groups among other supermarket employees.

45-0028
VINYL CHLORIDE

Johnson, Carl J. and Anderson, Herbert W.
MEAT-WRAPPERS ASTHMA: A CASE STUDY
J. Occup. Med. 18 (2): 102-104 (February 1976)

A review of the investigation of respiratory illness in workers in a meat-packing plant exposed to the pyrolysis products of polyvinyl chloride wrapping produced by a thermocutting and sealing machine.

Infante, Peter F. et al
GENETIC RISKS OF VINYL CHLORIDE
Lancet 1 (7962): 734-5 (3 April 1976)

Wives of workers exposed to vinyl chloride monomer demonstrated greater fetal loss than a control group. Vinyl chloride has been shown to be a mutagen in microbial test systems and significant excesses of chromosomal aberrations have been observed in workers exposed to vinyl chloride monomer. The authors suggest that fetal loss may be the result of germ-cell damage in the father through direct vinyl chloride monomer exposure.

45-0030
GENERAL INFORMATION

Anon
NITROFURANS: CANCER POTENTIAL?
Environ. Rep. 6 (23): 182 (14 April 1976)

The substances in question are used to increase resistance to disease in animals which supply food to humans. The General Accounting Office has issued a recent report charging that the FDA, despite its belief in early 1974 that one of the nitrofurans was a carcinogen and the others were highly suspect, made no efforts to determine the extent of residues in marketed food. In response, the FDA plans to reissue a 1971 hearing notice on the subject. The notice is expected to indicate FDA's intention to ban the substances.

45-0031
GENERAL INFORMATION

Anon
FDA MAY SOON ACT TO REMOVE ZIRCONIUM ANTIPERSPIRANT SPRAYS FROM THE MARKET
Chem. Eng. News 54 (17): 12 (19 April 1976)

The action is prompted by concern over the possibility that inhalation of minute zirconium particles in the spray can cause chronic lung disease.

45-0032
GENERAL INFORMATION

Anon
Du PONT CHEMICALS SPARK LAW SUIT IN NEW JERSEY
Chem. Week 118 (16): 17 (21 April 1976)

News report on a suit being brought by American Cyanamid employees against du Pont alleging exposure to du Pont's alpha- and beta-naphthylamines used in the manufacture of dyes & pigments has resulted in "severe personal injuries" and "great mental and physical pain."

45-0033
GENERAL INFORMATION

Rose, Vernon E.
STANDARDS FOR THE CONTROL OF CARCINOGENS IN THE WORKPLACE
J. Occup. Med. 18 (2): 81-4 (February 1976)

The author reviews the history of the development of standards for toxic substances, discusses various control strategies employed by governments and industries, and suggests an approach for future action relative to developing and improving toxic substance control standards.

45-0034
GENERAL INFORMATION

Sayad, R.S. et al
METHYLENE CHLORIDE IN HAIR SPRAY
Soap, Cosmet. Chem. Spec. 52 (3): 87-8, 90, 134, 136 (March 1976)

Concern over possible health effects of exposure to methylene chloride (which is used in many cosmetic products) prompted Dow Chemical and Alberto-Culver companies to undertake this study. Beauty salon operators were exposed under controlled conditions to methylene chloride hair sprays. Although methylene chloride has been reported to metabolize the carbon monoxide in the blood, resulting in an increase of carboxy hemaglobin, the carboxy hemaglobin level in the subjects exposed to the methylene chloride hairsprays was only slightly higher than the control. The authors conclude that methylene chloride can be used safely in aerosol, and other products.

45-0035
GENERAL INFORMATION

Anon
STYRENE-LEUKEMIA LINK NOT FOUND IN STUDY
Chem. Eng. News 54 (18): 20-1 (26 April 1976)

Contrasted to recent U.S. reports of a possible link between occupational exposure to styrene and leukemia, the chief medical adviser of BASF in West Germany reports no detrimental health effects from exposure to styrene. The article notes OSHA and NIOSH activities in gathering information on the U.S. cases for further study.

45-0036
GENERAL INFORMATION

Anon
NIOSH WARNS THAT DIMETHYLCARBAMOYL CHLORIDE MAY BE A CARCINOGEN
Chem. Eng. News 54 (18): 7 (26 April 1976)

NIOSH director, John Finklea, has warned researchers that dimethylcarbamoyl chloride has been linked with skin tumors and squamous cell carcinomas in mice.

45-0037
GENERAL INFORMATION

Anon
SIX LEUKEMIA DEATHS AMONG WORKERS EXPOSED TO BENZENE
Chem. Eng. News 54 (18): 7 (26 April 1976)

NIOSH is investigating deaths from leukemia in 6 workers exposed to benzene as a solvent in the manufacture of a rubber-based transparent film.

45-0038
GENERAL INFORMATION

Andrasch, Ruediger H. and Bardana, Emil
THERMOACTIVATED PRICE-LABEL FUME INTOLERANCE. A CAUSE OF MEAT-WRAPPER'S ASTHMA
J. Am. Med. Assoc. 235 (9): 937 (1 March 1976)

A report of a case of respiratory illness in a meat cutter resulting to exposure to fumes from a heat-activated price label adhesive.

45-0039
GENERAL INFORMATION

Keen, R.C. and Mumford, C.J.
A PRELIMINARY STUDY OF HAZARDS TO TOXIC WASTE DISPOSAL OPERATORS ON TEN LANDFILL SITES IN BRITAIN
Ann. Occup. Hyg. 18: 213-28 (1975)

The authors review the nature and amounts of toxic materials disposed and present an overview of the potential hazards to workers at these sites.

46-0001
ACRYLONITRILE
(Regulations and Standards)

Anon
NIOSH PONDERS STANDARDS FOR LONG LIST OF WIDELY USED CHEMICALS
Chem. Week 118 (18): 10 (5 May 1976)

By June 1976, NIOSH will decide if it should develop recommended standards for occupational exposure for 23 chemicals, including acrylonitrile, organoisocyanates, and nitrobenzenes. If so, the recommendations will be ready by 1980.

Definitely planned for 1979 are recommended standards for occupational exposure to dichloroethyl ether, cesium, lithium and potassium hydroxides, iron compounds, chlorinated benzene, and several mercaptans.

46-0002
ACRYLONITRILE
(Regulations and Standards)

Anon
NEW EXPOSURE LIMITS
Chem. Week 118 (19): 25 (12 May 1976)

In draft proposals issued recently by OSHA the proposed exposure limits and worker protection standards for 17 chemicals include a proposed limit of 20 ppm for acrylonitrile.

46-0003
ACRYLONITRILE
(Production)

Anderson, Earl V.
OUTPUT OF THE TOP 50 CHEMICALS DROPS SHARPLY
Chem. Eng. News 54 (19): 34-7 (3 May 1976)

Production of the top 50 chemicals in the U.S. dropped drastically in 1975 to 411 billion lb (12.1%) to reach a level below that of 1972. Production of acrylonitrile was only 1.22 billion lb in 1975, compared to 1.41 billion lb in 1974. Vinyl chloride production dropped to 4.20 billion lb compared to 5.62 billion lb in 1974, and titanium dioxide dropped to 1.21 billion lb from 1.57 billion lb in 1974.

46-0004
ACRYLONITRILE
(Production)

Anon
KEY CHEMICALS: PROPYLENE
Chem. Eng. News 54 (20): 11 (10 May 1976)

After a sharp drop in 1975, propylene production in 1976 is expected to rise to almost 10 billion lb, and will probably continue to sell at about 8.5 cents a lb. One of the major derivatives of propylene is actylonitrile and a recovery in demand for this chemical and other propylene derivatives will boost propylene market.

46-0005
ACRYLONITRILE

Anon
MONSANTO GIVES UP NOVEL WASTE DISPOSAL PLAN
New Scientist 69 (988): 395 (19 February 1976)

After investigating a number of alternative disposal methods for the effluents from its acrylonitrile plant at Seal Sands in England (including spending almost 500,000 British pounds for a deep-well injection project), Monsanto concludes that it must still dump the effluents (containing organics, nitriles (organo-cyanide derived chemicals), and ammonium sulfate) into the river Tees.

46-0006
ACRYLONITRILE

Anon
ENVIRONMENTALISTS SUE TO BLOCK PLASTIC BOTTLES
Chem. Week 118 (17): 17 (28 April 1976)

Claiming that plastic beverage bottles have not been sufficiently tested for potential dangers from the leaching of their contents and that the bottles waste energy, the Natural Resources Defense Council wants the federal court to act against FDA's approval of their use. Plastic bottles now sold by Monsanto, Vistron, and Borg-Warner use acrylonitrile resin; those sold by Du Pont are polyester bottles. According to the FDA, acrylonitrile is safe in food-contact articles.

46-0007
ASBESTOS

Anon
NO ASBESTOS IN TALC
Soap, Cosmet. Chem. Spec. 52 (4): 81 (1976)

According to the Cosmetic, Toiletry and Fragrance Assn., results of 4000 analytical tests show that there is no asbestos in talc powders produced since 1973. Analyses of 76 talcs, purchased in retail stores in 1975 by FDA, also gave negative results for the presence of asbestos. CFTA claims that Mt. Sinai Hospital studies indicating that there was asbestos in baby talcs were conducted on products made in 1970 or earlier.

46-0008
ASBESTOS

Anon
ASBESTOS/DRINKING WATER
Environ. Rep. 7 (1): 3 (3 May 1976)

The EPA has found asbestos fibers in the drinking water of several cities. Highest levels were reported in Philadelphia waters, but measurable amounts were found in Atlanta, Boston, San Francisco, and Seattle.

Although EPA is not raising an alarm over these findings, the agency will study its monitoring results in an attempt to determine by the end of the year if the presence of asbestos in drinking water is a serious concern. Human cancers traced to asbestos have usually followed inhalation of the chemical.

46-0009
ASBESTOS

Kogan, F.M. et al
DYNAMICS OF ASBESTOSIS AND ASBESTOTUBERCOLISIS AND CERTAIN FACTORS WHICH DETERMINE IT
AD 772 086/5 (November 27, 1973) 11pp. (Translation of Gigiena Truda i Prof. Zabolevaniya (USSR) n 10 p 4-8 1972, by Victor Mesenzeff

In sclerogenic pneumoconioses with asbestosis the most unfavorable course was observed in the post-dust period. However, these data are based on a relatively small number of observations and over short periods. Furthermore, the role of individual factors which affect the dynamics of the process is unclear. In view of this, materials were developed for a dynamic observation carried out at the Medical and Sanitary Section (MSS) of the 'Uralasbest' Combine from 1947 to 1969 on 390 individuals afflicted with uncomplicated asbestosis and 50 individuals afflicted with asbestotuberculosis. The initial diagnosis was confirmed at the Sverdlovsk Institute of Industrial Health and Occupational Diseases.

[Abstract in: Industrial Health Hazards Due to Atmospheric Factors. A Bibliography with Abstracts NTIS/PS-75/800, p.50 (October 1975)]

46-0010
ASBESTOS

Kogan, F.M.
THE CONNECTION OF PHYSICAL AND CHEMICAL FEATURES OF ASBESTOS WITH THEIR PATHOGENIC EFFECT
AD 753 516 (November 17, 1972) 27pp. (Translation of Patogenez Pnevmokoniozov Trudy Vsesoyuznogo Simpozyuma, n.p., 18-20 November 1968. Sverdlovsk, 1970 p. 16-34, by R. Wallace

A general outline is given of the carcinogenic behavior of asbestos, and the effect of it and other mineral powders in inducing fibrosis and asbestosis.

[Abstract in: Industrial Health Hazards Due to Atmospheric Factors. A Bibliography with Abstracts NTIS/PS-75/800, p.84 (October 1975)]

National Research Council. Committee on Biological Effects of Atmospheric Pollutants
AIRBORNE ASBESTOS
PB-198 581 (1971)

The report (1) summarizes the major evidence of the pathogenicity of asbestos in man and animals, (2) summarizes the evidence of human nonoccupational exposure to asbestos, (3) evaluates the evidence of a health risk associated with various degrees and types of exposure, (4) identifies sources of environmental contamination by asbestos, and (5) offers recommendations concerning the need for and feasibility of control measures.

[Abstract in: Industrial Health Hazards Due to Atmospheric Factors. A Bibliography with Abstracts. NTIS/PS-75/800, p.132 (October 1975)]

Anon
A BENZIDINE-FREE DIRECT BLACK HAS BEEN DEVELOPED. ATLANTIC HAS IT.
Am. Dyest. Rep. 65 (3): 27 (March 1976)

Atlantic Chemical Corporation is advertising its new Resin Fast Black LW-BF for rayon and cotton and Nylon Black RLW-BF for nylon and wool as examples of recently-developed benzidine-free dyes designed to meet OSHA's regulation for finishing plant effluents containing no benzidine.

46-0013
FLUOROCARBONS

Sandorfy, C.
U.V. ABSORPTION OF FLUOROCARBONS
Atmos. Environ. 10 (5): 343-51 (1976)

The possible depletion of stratospheric ozone by the widely-used fluorocarbons prompted this review of the photoelectron and far-u.v. absorption spectra of fluorocarbons, particularly those containing chlorine. Photochemical decomposition of fluorocarbons is discussed in relation to the location of their absorption bands. Chlorofluorocarbons containing two or more chlorines, which absorb more strongly and at lower frequencies than those containing only one chlorine, are more apt to undergo photochemical decomposition.

46-0014
FLUOROCARBONS

Graedel, T.E. and Allara, D.L.
TROPOSPHERIC HALOCARBONS: ESTIMATES OF ATMOSPHERIC CHEMICAL PRODUCTION
Atmos. Environ. 10 (5): 385-8 (1976)

From a discussion of the homogeneous chemical and photochemical processes plus the heterogeneous chemical processes that might be involved in the production of halocarbons detected in tropospheric air, the authors conclude that their formation is most likely caused by emissions of chemical species synthesized by natural nonatmospheric processes.

46-0015
FLUOROCARBONS

Anon
EXPECT FLUOROCARBON BAN IN 2-3 YEARS
Mod. Packag. 49 (4): 6 (1976)

The Government may act by the end of 1976 to ban fluorocarbon propellants, setting a two or three year limit to their legal use, according to a study conducted by Arthur D. Little, Inc. About 66% of fluorocarbon emissions derive from aerosols and about 27% are traced to refrigeration and air conditioning. Replacements for fluorocarbon propellants include pump sprays, which now hold about 20% of the hairspray market, and alternative propellants. None of the latter has yet been too successful in the personal care consumer market.

46-0016
FLUOROCARBONS

Anon
ALLIED, DU PONT ARE SEEKING STRATOSPHERICALLY SAFE FLUOROCARBONS
Chem. Week 118 (18): 36 (5 May 1976)

Should the Government ban the use of trichloromonofluoromethane, dichlorodifluoromethane, and other fluorocarbon propellants, industry hopes to be ready with alternative products. Both Allied Chemical and Du Pont are conducting research on alternative fluorocarbons that should not affect the stratospheric ozone.

46-0017
FLUOROCARBONS

Anon
MCA COLLECTS PRODUCTION DATA ON FLUOROCARBONS
Soap, Cosmet. Chem. Spec. 52 (4): 87 (1976)

To provide scientists with better data for calculating the possible effects of fluorocarbons on the atmosphere, the Manufacturing Chemists Assoc., Washington, D.C., has collected production data on trichlorofluoromethane (FC-11), dichlorodifluoromethane (FC-12), and chlorodifluoromethane (FC-22) propellants and refrigerants from the time of their first commercial manufacture through 1975. These data are available on an annual and cumulative basis. MCA has also collected sales data according to major end use. Through 1975, world production was 7,562 million lb, 11,197 million lb, and 1,670 million lb for FC-11, FC-12, and FC-22, respectively.

46-0018
FLUOROCARBONS

Anon
FREE WORLD AEROSOL OUTPUT UP IN '74
Soap, Cosmet. Chem. Spec. 52 (4): 79-80 (1976)

In 1974 the ozone controversy did not seem to affect aerosol production in the free world exclusive of the U.S. and Canada. Except for Japan, where 1974 production dropped 5.4% under 1973 production, the 1974 output from Australia, the United Kingdom, Western Europe (France, W. Germany, Italy and the Benelux Countries), and South America (Argentina and Brazil) was over 2.16 billion units, an increase of 14% over 1973 production. Retail sales of aerosols dropped in Japan, where Japanese fluorocarbon producers are supporting research on hydrocarbons and dimethyl-ethers as alternative propellants.

46-0019
FLUOROCARBONS

Anon
AEROSOLS: SKY WON'T BE THE LIMIT
Chem. Week 118 (19): 46, 48 (12 May 1976)

U.S. aerosol production has dropped 15-25% below the almost 3 billion units produced in 1973 because of the ozone controversy. Production by 1980, however, is expected to increase over the high point of 1973 and to zoom to over 4 billion units by 1985. Research results clearing the chlorofluorocarbons of serious hazardous effects on stratospheric ozone, increased consumer spending, and greater success with nonchlorofluorocarbon propellants are some of the limiting factors. Potentially safe alternatives for F-11 and F-12 in aerosols are F-22, F-133a, F-142b, F-152a and several chlorofluorocarbons in the 120 series.

46-0020
FLUOROCARBONS

May, T.W.
EXPLOSION DURING HALOTHANE ANAESTHESIA
Br. Med. J. 1 (6011): 692-3 (20 March 1976)

The author reports a case of an explosion while using halothane as an anesthetic during a dental procedure. Halothane is generally considered to be non-explosive. The suggestion is made that static electricity in the atmosphere of the surgery may have been sufficient to "spark" the explosion.

46-0021
FLUOROCARBONS

Rahn, Kenneth A. et al
TROPOSPHERIC HALOGEN GASES: INORGANIC AND ORGANIC COMPONENTS
Science 192 (4239): 549-50 (7 May 1976)

Simultaneous measurements at 4 locations showed that the gaseous tropospheric halogens chlorine, bromine, and iodine are chiefly organically bound. These organic components varied less than the inorganic components and their atmospheric residence times were longer (2 to 6 weeks) than the atmospheric residence times for inorganic gaseous components (1 to 2 weeks).

46-0022
FLUOROCARBONS

Ruderman, M.A. and Foley, H.M.
ELEVEN-YEAR VARIATION IN POLAR OZONE AND STRATOSPHERIC-ION CHEMISTRY
Science 192 (4239): 555-7 (7 May 1976)

The 11-year variation in total ozone at high latitudes and high altitudes has been reported to be caused by the modulation of galactic cosmic rays by solar wind magnetic fields. This paper suggests that the periodic component of cosmic-ray ionization, limited to high latitudes, may be the causative mechanism.

46-0023
FLUOROCARBONS

Reck, Ruth A.
STRATOSPHERIC OZONE EFFECTS ON TEMPERATURE
Science 192 (4239): 557-9 (7 May 1976)

Reported calculations indicate that stratospheric ozone depletion has a smaller effect on surface temperature changes than has been previously reported.

46-0024
HALOETHERS

IARC Working Group
IARC MONOGRAPHS ON THE EVALUATION OF THE CARCINOGENIC RISK OF CHEMICALS TO MAN, Vol. 9. SOME AZIRIDINES, N-, S-, & O-MUSTARDS AND SELENIUM
Proc. IARC Working Group on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Lyon, France, Apr. 8-14, 1975. 268 pp. $10.79 softbound.
in: Current Contents, Life Sciences 16 (19): 21 (10 May 1976)

One of the compounds discussed (pp. 117-24) is bis(2-chloroethyl) ether.

HALOETHERS

See: 46-0001, Acrylonitrile

46-0025
HEXACHLOROBENZENE

Richter, E. and Schmid, A.
HEXACHLOROBENZENE CONTENT IN THE WHOLE BLOOD OF CHILDREN
Arch. Toxicol. 35 (2): 141-7 (1976)

The blood of approximately 200 children (1-18 yrs old) was analyzed for HCB which begins to appear in the blood at age 9-10 months and which exhibits a positive hyperbolic correlation with age. The possibility of environmental factors is suggested.

46-0026
HEXACHLOROBENZENE

Koss, G. et al
STUDIES ON THE TOXICOLOGY OF HEXACHLOROBENZENE
Arch. Toxicol. 35 (2): 107-14 (1976)

The results of these experiments involving rats indicate a relatively large degree of degradation of HCB to metabolite found in the excreta and tissues of the animals. The authors suggest that this biodegradation should be considered when evaluating the toxicity of HCB.

Nelson, S.D. et al
APPLICATION OF CHEMICAL IONIZATION MASS SPECTROMETRY AND THE TWIN-ION TECHNIQUE TO BETTER DEFINE A MECHANISM IN ACETYLHYDRAZINE TOXICITY
Biochem. Biophys. Res. Commun. 69 (4): 900-7 (1976)

Acetylhydrazine, possibly a toxic metabolite of isoniazid, may be the cause of the hepatitis that followed use of the drug in treating tuberculosis. A reaction sequence is postulated for the oxidation of acetylhydrazine in this attempt to define its toxic mechanism.

See: 46-0001, Acrylonitrile

46-0028
LIQUEFACTION AND GASIFICATION OF COAL

Anon
OUTLOOK BRIGHT FOR COAL AS A CHEMICAL FEEDSTOCK
Coal Age 81 (4): 71 (1976)

The combination of such factors as an upswing in the cost of natural gas, more coal, and an increasing use of domestic oil and gas for petrochemicals will give added emphasis to R & D efforts on coal and shale conversion to chemicals by 1980, according to a study by Chem Systems Inc.

46-0029
LIQUEFACTION AND GASIFICATION OF COAL

Cochran, Neal P.
OIL AND GAS FROM COAL
Sci. Am. 234 (5): 24-9 (1976)

Review of carbonization, direct hydrogenation, the extraction process, and the Fischer-Tropsch synthesis, which are identified as the four basic methods of liquefying or gasifying coal.

Ahner, David J. et al
ECONOMICS OF POWER GENERATION FROM COAL GASIFICATION FOR COMBINED-CYCLE POWER PLANTS
Combustion 47 (10): 26-35 (April 1976)

The authors present a discussion of the operation, performance and costs associated with a large integrated coal gasification combined cycle plant.

Anon
NIOSH PROPOSES STANDARD FOR ETHYLENE DICHLORIDE
Chem. Week 118 (17): 18 (28 April 1976)

NIOSH's proposed worker exposure standard for ethylene dichloride sets a limit of 5 ppm as a 10-hr time-weighted average and up to 15 ppm for any 15-minute peak exposure.

OSHA may reconsider standards for tetrachloroethylene and 1,1,1-trichloroethane.

46-0032
PHTHALATES

Lawrence, W.H. et al
A TOXICOLOGICAL INVESTIGATION OF SOME ACUTE, SHORT-TERM, AND CHRONIC EFFECTS OF ADMINISTERING DI-2-ETHYLHEXYL PHTHALATE (DEHP) AND OTHER PHTHALATE ESTERS
Environ. Res. 9, 1-11 (1975)

Mice and rabbits were used to study the toxicity of 12 phthalic acid esters. The results show that most of these phthalates have a chronic toxicity 2-4 times greater than their acute toxicity. However, the chronic toxicities di-n-octyl phthalate and di-2-ethylhexyl phthalates were respectively, 21.74 times and 27.99 times greater than the acute toxicities for those phthalates.

46-0033
PHTHALATES

Petersen, Robert V. et al
TOXICOLOGY OF PLASTIC DEVICES HAVING CONTACT WITH BLOOD
PB 250 102/1WJ (23 August 1975) 248 p.

The project was primarily concerned with toxicological evaluation of polyvinyl chloride and, more specifically, the commonly used plasticizer, di(2-ethylhexyl) phthalate (DEHP). Evaluations are primarily concerned with long range, subtle toxicity potential, although many basic acute and subacute studies were also conducted. The project is divided into twelve tasks including an organizational phase, plastic composition studies, acute toxicity studies, tissue culture studies, subacute toxicity studies, metabolite identification, teratogenic studies, neurologic studies, larger animal studies, analyses of human blood exposed to plastics during hospital procedures, and possible statistical analysis of human patients following extensive exposure of blood to plastics.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, (26 April 1976)]

46-0034
POLYURETHANES
(Uses)

Anon
NAVY LAB HAS DEVELOPED NEW EPOXY RESINS TO PREVENT CORROSION
Chem. Week 118 (18): 10 (5 May 1976)

Having synthesized fluoropolymer properties into liquid epoxy resins, NRL scientists are now field testing 20 new coating materials designed to protect military vehicles from corrosion and weather. One material expected to prevent marine borer attack on wood uses pigmented fluoropolyurethanes.

46-0035
SHALE OIL EXTRACTION AND REFINING

Anon
SHALE OIL FACES UPHILL STRUGGLE
Hydrocarbon Process. 55 (4): 19 (1976)

Shell Oil Co., operator of a Colorado 5100-acre federal oil shale tract, has proposed a 4-phase plan for development of the project. Shell, and its partner Ashland Oil Co., expect their environmental impact studies to be completed in late 1976. However, Congress is reluctant to fund such development and environmentalists claim that shale oil development is the most ecologically destructive plan in the energy-resources area.

46-0036
SHALE OIL EXTRACTION AND REFINING

Burke, Hubert D.
WILDLIFE AND OIL SHALE: A PROBLEM ANALYSIS AND RESEARCH PROGRAM. Volume I. Report (PB-250 521). Volume II. Appendix (PB-250 522). (September 1975)

The program analysis and research program considers the natural and social environment of the Oil Shale Region of northwestern Colorado, northeastern Utah, and southwestern Wyoming. The purpose was to examine and evaluate the probable consequences of a developing oil shale industry upon the environment, to devise research studies that would evaluate environmental and social changes, and to assist in avoiding or mitigating undesirable changes, particularly as they pertain to wildlife. The analysis was done by a group of nineteen highly qualified scientists with extensive experience in the region or related areas. These scientists reviewed problems and designed appropriate studies. Through screening by sets of 'key questions', the original 162 studies submitted were reduced to 128. Ten studies were selected from this number as 'Priority Studies' recommended for immediate implementation.

The appendix is designed to apply to the program of studies recommended in the problem analysis and research program Volume I. It has two purposes: (1) to provide references that may be used in the preparation of requests for proposals or for studies, and (2) to suggest a core group of references for a reference library for research. The references that follow are listed taxonomically as follows: aquatic ecosystems, water quality, terrestrial ecosystems, industrial impacts on wildlife, reptiles and amphibians, blood-sucking arthropods and disease vectors.
[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, (3 May 1976)]

46-0037
VINYL CHLORIDE

Dyer, Robert F. and Esch, Victor H.
POLYVINYL CHLORIDE TOXICITY IN FIRES. HYDROGEN CHLORIDE TOXICITY IN FIRE FIGHTERS
J. Am. Med. Assoc. (4): 393-7 (26 January 1976)

One fireman exposed to fumes from burning plastic and Teflon office copying machine died 24 hours later. Postmortem signs included severe pulmonary hemorrhage, edema, and coronary artherosclerosis. Other fireman involved experienced varying symptoms of chest discomfort, vertigo, nausea, conjunctivitis, etc.

A study of 170 firemen exposed to hydrogen chloride fumes from burning PVC from 1 to 4 times between January 1970 and September 1974 disclosed symptoms of acute toxicity, chest pains, dyspnea and other effects.

46-0038
VINYL CHLORIDE

Loprieno, N. et al
EVALUATION OF THE GENETIC EFFECTS INDUCED BY VINYL CHLORIDE MONOMER (VCM) UNDER MAMMALIAN METABOLIC ACTIVATION: STUDIES IN VITRO AND IN VIVO
Mutat. Res. 40 (2): 85-96 (April 1976)

Inhalation studies with mice produced no VC-related mutagenicity, probably because of difficulties in obtaining the right concentrations of the gas. Ingestion of VC by mice showed a mutagenic effect on yeast cells innoculated into the peritoneum of the mice. Similar results were obtained in *in vitro* studies using yeast cells. The authors conclude that in addition to being mutagenic for eukaryotic organisms such as yeast, VCM can produce other genetic changes, such as gene conversion.

46-0039
VINYL CHLORIDE

Filatova, V,S. and Antonyuzhenko, V.A.
DYNAMICS OF HYGENIC WORKING CONDITIONS AND OCCUPATIONAL DISEASE INCIDENCE AMONG WORKERS IN SUSPENSION POLYVINYL CHLORIDE PRODUCTION OVER A NUMBER OF YEARS
PB 233 614-T (July 1974) 7 pp. (Translation of Gigiena Truda i Prof. Zabolevania (USSR) vol. 15 (4): 32-4 (1971)

The occupational disease incidence in workers resulting from vinyl chloride air pollution was studied over a period of 17 years (1953-69). Although industrial conditions have improved, there still occurs new cases of chronic occupational poisoning. Various clinical manifestations of chronic vinyl chloride poisoning, as a function of environmental air pollution have been established. A series of measures designed to improve air quality in work areas is suggested.

[Abstract in: Industrial Health Hazards Due to Atmospheric Factors. A Bibliography with Abstracts NTIS/PS 75/800, p.24 (October 1975)]

46-0040
VINYL CHLORIDE

Anon
KEY CHEMICALS: ETHYLENE
Chem. Eng. News 54 (20): 10 (10 May 1976)

It appears that production of ethylene in 1976 will reach 26 billion lb, topping the 1974 peak of 23.5 billion lb. A slight price increase is anticipated in the Fall. Vinyl chloride is one of the major derivatives of ethylene.

46-0041
VINYL CHLORIDE

Anon
VINYL CHLORIDE EMISSIONS. . .
Am. Ind. Hyg. Assoc., J. 37 (4): A-8 (1976)

The EPA has announced proposed standards which would reduce to 10 ppm allowable VC emissions from VC processing plants and PVC and ethylene dichloride manufacturing plants.

46-0042
VINYL CHLORIDE

Environmental Protection Agency, Office of Air Quality Planning & Standards
STANDARD SUPPORT AND ENVIRONMENTAL IMPACT STATEMENT: EMISSION STANDARD FOR VINYL CHLORIDE
PB 249 703/OWJ (October 1975) 536p.

A national emission standard for vinyl chloride emitted from ethylene dichloride-vinyl chloride and polyvinyl chloride plants is being proposed under the authority of section 112 of the Clean Air Act. Vinyl chloride has been implicated as the causal agent of angiosarcoma and other serious disorders, both carcinogenic and noncarcinogenic, in people with occupational exposure and in animals with experimental exposure to vinyl chloride. Reasonable extrapolations from these findings cause concern that vinyl chloride may cause or contribute to the same or similar disorders at present ambient air levels. The purpose of the proposed standard is to minimize vinyl chloride emissions from all known process and fugitive emission sources in ethylene dichloride-vinyl chloride and polyvinyl chloride plants to the level attainable with best available control technology. This would have the effect of furthering the protection of public health by minimizing the health risks to the people living in the vicinity of these plants and to any additional people who are exposed as a result of new construction. This is estimated to have the effect of reducing emissions from a typical ethylene dichloride-vinyl chloride plant by approximately 94 percent and from a typical polyvinyl chloride plant by approximately 95 percent. Environmental Impact and Inflation Impact Statements quantifying the impacts of the proposed standard and alternative control levels are included in the document.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, (12 April 1976)]

46-0043
VINYL CHLORIDE

Anon
DEMAND OUTLOOK STRONG
Chem. Week 118 (19): 26 (12 May 1976)

G.F. Cohan of B.F. Goodrich Co. predicts sales of PVC for 1976 will be at the 1974 level and are expected to increase 11%/year through 1980 when 7 million pounds will be sold. Concern over the toxicity of combustion products of PVC is not expected to have a significant impact on demand.

46-0044
VINYL CHLORIDE

Crockett, Pernell W.
TOXICITY OF VINYL CHLORIDE (A BIBLIOGRAPHY WITH ABSTRACTS).
NTIS/PS 76/0197/4WJ (March 1976)

Research is cited on the health hazards from exposure to vinyl chloride and vinyl chloride resins. Studies are included on the epidemiology, industrial and public exposure to the compound, and its degradation and combustion products. (Contains 36 abstracts).

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, (3 May 1976)]

See: 46-0003, Acrylonitrile

See: 46-0033, Phthalates

46-0045
NITROSAMINES

Anon
A NITROSAMINE THAT DOESN'T LAST
Chem. Eng. News 54 (18): 30 (26 April 1976)

According to EPA, the carcinogen N-nitrosodimethylamine may form during the night in the atmosphere around factories emitting dimethylamine but would not persist in the daylight. The nitroso compound has a half-life of only approximately 30 minutes in direct sunlight. Nitrosamine formed during the day should also quickly disappear.

46-0046
NITROSAMINES

Wehner, Alfred P. et al
EFFECTS OF DIETHYLNITROSAMINE AND CIGARETTE SMOKE ON HAMSTERS
J. Nat. Cancer Inst. 56 (4): 749-56 (1976)

To study the effects of diethylnitrosamine (DEN) alone and in combination with cigarette smoke, 102 Syrian hamsters (2 months old) were given 12 weekly sc injections in the neck of 0.25 mg DEN. Fifty percent of the animals (Group A) inhaled cigarette smoke for 10 minutes, 3 times/day, 5 days/wk. The other 50% (Group B) were exposed to sham smoke. Results were compared with those in hamsters exposed only to cigarette smoke (Group C) or sham smoke (Group D).

Groups A and C experienced more severe lung lesions than Groups B and D, and Group A also experienced more frequent and severe emphysema and more liver degeneration than the other groups. No significant survival differences were noted among the four groups of hamsters.

Mohr, Ulrich et al
INTRASPLENIC TUMOR FORMATION IN THE SYRIAN HAMSTER (*MESOCRICETUS AURATUS*)
AFTER TRACHEAL IMPLANTS AND TREATMENT WITH DIETHYLNITROSAMINE
J. Nat. Cancer Inst. 56 (4): 811-8 (1976)

In one experiment untreated tracheal tissue from young Syrian hamsters was implanted in the spleen of their mothers, who later were injected sc with diethylnitrosamine (DEN). In another experiment, the mothers received DEN treatments. In both experiments, papillomas formed, but formation was faster in those animals receiving the DEN-pretreated implants. The DEN-pretreated tracheal grafts induced a more significant carcinogenic response.

46-0048
GENERAL INFORMATION

Ziskind, Morton et al
SILICOSIS
Am. Rev. Respir. Dis. 113 (5): 643-5 (April 1976)

This state-of-the-art review on silicosis involves 127 references, covering the literature from 1913 to 1975. Topics discussed include, among others, occupational sources, pathogenesis, pathology, treatment, and prevention of the disease.

46-0049
GENERAL INFORMATION

Brown, K.W.
AMERICIUM. ITS BEHAVIOR IN SOIL AND PLANT SYSTEMS
PB 250 797/8WJ (January 1976) 18p.

The small amount of data available on the behavior of americium in plant and soil systems is reviewed and found lacking in several critical areas. Although some studies have been done on the physical and chemical interaction of americium on these systems, most of them were short-term and limited in scope. As americium is classified as a hazardous radionuclide and is likely to increase in importance as an environmental pollutant, further study is suggested. Also, the use of americium as a tool for measuring various soil parameters is discussed.

46-0050
GENERAL INFORMATION

Maddock, B.G. and Taylor, D.
THE ACUTE TOXICITY OF DISSOLVED ELEMENTAL PHOSPHORUS TO COD (*GADUS MORHUA*)
Water Res. 10: 289-94 (1976)

Previous research produced conflicting evidence regarding the toxicity of phosphorus to aquatic life. This study, designed to measure the acute toxicity to marine organisms of elemental phosphorus in true solution, demonstrates an incipient lethal level of approximately 1-2 μg l^{-1}. The rapid assimilation of elemental phosphorus into the tissues of the animals was also shown. Some preliminary data is presented which indicates a half-life for the phosphorus in tissue of about 1 hour after cessation of exposure.

46-0051
GENERAL INFORMATION

Cheremisinoff, Paul N. and Holcomb, William F.
MANAGEMENT OF HAZARDOUS AND TOXIC WASTES
Pollut. Eng. 8 (4): 24-32 (1976)

A review on the nature of hazardous waste; the regulations relative to their disposal; current disposal practices including landfill, incineration, chemical treatment and ocean dumping; and an outline of EPA's position regarding each of the disposal methods outlined.

46-0052
GENERAL INFORMATION

Anon
HEART DISEASE, CANCER LINKED TO TRACE METALS
Chem. Eng. News 54 (19): 24-7 (3 May 1976)

Studies reported at the recent Anaheim, Calif., annual meeting of the Federation of American Societies for Experimental Biology suggest that heart disease may be influenced by variations in dietary and environmental levels of various metals, e.g., copper, zinc, and selenium. Fewer deaths from heart disease were reported in several selenium-rich areas of the U.S., and selenium apparently helps to correct some of the biological harm caused by cadmium, according to researchers from the Cleveland Clinic. A decrease in copper concentration upsets the copper-zinc dietary balance and may be responsible for an increased rate of heart attacks. High selenium diets have been associated with low cancer rates.

46-0053
GENERAL INFORMATION

Hook, Ernest B. and Healy, Kristine M.
CONSEQUENCES OF A NATIONWIDE BAN ON SPRAY ADHESIVES ALLEGED TO BE HUMAN TERATOGENS AND MUTAGENS
Science 191 (4227): 566-7 (13 February 1976)

When the Consumer Product Safety Commission reported in August 1973 that spray adhesives might have adverse genetic effects, the products were banned from the market and pregnant women exposed to the sprays underwent examinations, had abortions, etc. Six months later the sales ban was lifted, after further studies failed to confirm the potential teratogenic or mutagenic effects of spray adhesives. This episode indicates a real need to establish toxicity of products instead of merely suspecting that they may be harmful.

46-0054
GENERAL INFORMATION

Stewart, Richard D. and Hake, Carl L.
PAINT-REMOVER HAZARD
J. Am. Med. Assoc. 235 (4): 398-401 (26 January 1976)

Individuals with diseased cardiovascular systems, in particular, should avoid using paint removers containing methylene chloride because this chemical is rapidly metabolized to carbon monoxide. On exposure for several hours, the body's carboxyhemoglobin levels rise to hazardous levels.

46-0055
GENERAL INFORMATION

Anon
BACTERIAL INDICATORS SYMPOSIUM
Environ. Rept. 7 (1): 3 (3 May 1976)]

On June 28-29 at its annual meeting in Chicago, the Am. Soc. for Testing Materials will hold an International Symposium on Bacterial Indicators of Potential Health Hazards Associated with Water. Information on this registration-free symposium, which will cover voluntary concensus standards for materials and products, is available from H. Hamilton, ASTM, 1916 Race St., Phila., Pa 19103.

Anon
NEW PHENOLS LOOK SHIPSHAPE AS BIOCIDES
Chem. Week 118 (17): 67-8, 70 (28 April 1976)

New benzylphenol and cinnamylphenol compounds synthesized at USDA's Western Regional Research Center contain only carbon, hydrogen, and oxygen. The absence of metals, halogens, nitrogen, and phosphorus indicates that the new compounds, which have shown good bactericidal, fungicidal and related properties, suggests that the new phenols may be environmentally safer than currently used biocides. On the basis of sea tests, the Navy has shown interest in the compounds as wood preservatives.

See: 46-0001, Acrylonitrile

See: 46-0002, Acrylonitrile

Anon
ACRYLONITRILE CATALYST
Chem. Eng. 83 (11): 111 (24 May 1976)

According to Standard Oil Co. (Ohio) of Cleveland, the acrylonitrile catalyst that was developed by Nitto Chemical Industry Co., Ltd. (Tokyo) (See: CATS 43-0001), cuts down by-product yield to give a purer acrylonitrile in higher yield. Sohio, the U.S. distribution of the new catalyst, indentified as Catalyst NS 733A, also cites a potential economic gain of as much as 1%/lb of acrylonitrile produced.

47-0002
ASBESTOS

Berry, G. and Wagner, J.C.
EFFECT OF AGE AT INOCULATION OF ASBESTOS ON OCCURRENCE OF MESOTHELIOMAS IN RATS
Int. J. Cancer 17 (4): 477-83 (15 April 1976)

Because the age of an individual at the time that he is first exposed to a carcinogen may be a factor governing the subsequent development of cancer, rats of different ages were injected i.p. with asbestos. Originally, 48 two-month old and 95 ten-month old rats were used. Later tests involved 16 rats (age 22 months) and 112 rats (age 17 months). Although only 17 (19%) of the ten-month old rats died with a mesothelioma, versus 19 (40%) of the two-month old rats, the older rats had a mean survival rate of only 469 days versus 704 days for the younger rats. Mesotheliomas occurred at a significantly ($p<0.01$) higher rate in the ten-month old rats. Although additional studies appear necessary, these rat studies indicate that exposure to a carcinogen at an earlier age carries a greater overall risk.

47-0003
ASBESTOS

Fligiel, Zuzana and Kaneko, Mamoru
MALIGNANT MESOTHELIOMA OF THE TUNICA VAGINALIS PROPRIA TESTIS IN A PATIENT WITH ASBESTOS EXPOSURE: A CASE REPORT
Cancer 37 (3): 1478-84 (1976)

The death from a malignant testicular mesothelioma of a 68-year-old male, who had regularly been exposed to asbestos during the 40 years he worked as a pipe insulator, is cited as the first recorded fatality of this type associated with asbestos exposure.

47-0004
ASBESTOS

Spurny, Kvetoslav R. et al
THE SAMPLING AND ELECTRON MICROSCOPY OF ASBESTOS AEROSOL IN AMBIENT AIR BY MEANS OF NUCLEPORE FILTERS
J. Air Pollut. Control Assoc. 26 (5): 496-8 (1976)

In an attempt to improve and simplify the direct separation of asbestos fibers from other airborne particulates, the use of Nuclepore filters in series was investigated. Preliminary data reported from tests in the U.S. and in Germany indicate that this filter technique may simplify the sampling and allow the asbestos fibers to be counted and sized directly, eventually providing the possibility of automatic counting.

47-0005
ASBESTOS

Kantz, Marcus E.
PROPOSED ASBESTOS AIR QUALITY STANDARDS (Letter to Editor)
J. Air Pollut. Control Assoc. 26 (5): 413-4 (1976)

Commenting on Bruckman and Rubino's proposed national ambient standard for asbestos emissions of 30 nanograms/cu m (See: CATS *37-0009), the author sees the suggested standard merely as an "improvement" of existing EPA standards. He questions the data evaluation techniques of Bruckman and Rubino and their assumptions that plants would readily comply to their proposed "state-of-the-art control technology," assumed by them to provide a 10-fold emissions reduction. Kantz argues that, unless best available control technology is used, environmental considerations would be subservient to economic/political considerations.

Bruckman, Leonard and Rubino, Robert A.
AUTHORS' REPLY: PROPOSED ASBESTOS AIR QUALITY STANDARD (Letter to Editor)
J. Air Pollut. Control Assoc. 26 (5): 414-6 (1976)

Refuting comments on their proposed national asbestos air quality standard (See: CATS 37-0009), the authors cite a 10-fold increase in the mesothelioma incidence rate in Connecticut between 1940 and 1970. While they are aware of the costs of over-reaction, they are disturbed by the increasing emphasis by some environmental personnel on economic/political considerations. After justifying their data and rationale, Bruckman and Rubino argue that adoption of their proposed emission standard (which would apply not only to manufacturing plants, but also to other sources of asbestos emissions) would cut emissions of asbestos from Connecticut plants to less then 1 ton/yr, a 10-fold improvement.

Fox, A.J. and White, G.C.
BLADDER CANCER IN RUBBER WORKERS. DO SCREENING AND DOCTORS' AWARENESS DISTORT THE STATISTICS?
Lancet 1 (7967): 1009-11 (8 May 1976)

Although the use of certain compounds believed to be bladder carcinogens has long been discontinued in the British rubber industry (alpha- and beta- naphthylamines have not been used since 1950; benzidine has not been used since 1956), an excess of bladder-cancer deaths (37 instead of an expected 19) were discovered in a recent study of deaths during 1972-74 of more than 40,000 rubber and cable workers. Even though rubber workers have been screened for bladder cancers, indicating possible early detection, there is no significant difference between their survival rates and those of non-rubber workers with bladder cancer. To determine the cause of these excess deaths, the rubber and cablemaking industries must become concerned with chemicals to which the cancer victims had been exposed.

Temple, Patrick J. and Linzon, Samuel N.
BORON AS A PHYTOTOXIC AIR POLLUTANT
J. Air Pollut. Control Assoc. 26 (5): 498-9 (1976)

Severe foliar injury (>35% foliar necrosis) was observed on trees in the vicinity of two branch plants of a Canadian Manufacturer of stoves and refrigerators. The observed effects were traced to boron emissions probably resulting from the spraying of enamel paints containing from 22-29% boron. Boron emissions causing vegetation injury were also traced to a fiberglass manufacturing company in which boric acid had been used as a flux.

From 134 to 1560 μg/g of boron were found in unwashed foliage from maple trees near the appliance plants. Boron content of 250 μg/g and over has been labeled excessive. This first report of the damaging effects of boron (with the exception of boranes and boron halides) suggests that damage to vegetation from boron may be more widespread than has been thought.

Beaudoin, A.R.
TERATOGENIC STUDIES WITH POLYBROMINATED BIPHENYLS
Abstract of paper to be Presented at The Teratology Society, 16th Ann. Mtg., 20-23
June 1976, Carmel, Calif.
in: Teratology 13 (2): 17A (April 1976)

Fetuses of pregnant rats that had received single doses (from 10 to 200 mg/per animal) of polybrominated biphenyls (PBB) in sesame oil by gavage on one day (day 6 through day 14 of pregnancy; sperm day = day 0) showed no skeletal malformations at autopsy (day 20). The 200 mg dose at day 12 or 13 produced soft tissue defects. Cleft palate (68%) and diaphragmatic hermia (48%) were observed in fetuses from the 200 mg dose at day 12; the same dose at day 13 yielded 91% cleft palate and 9% diaphragmatic hermia. A small incidence of cleft plate occurred from 100 mg PBB at day 13. Both 100 and 200 mg at day 6 killed all embryos.

47-0010
FLAME RETARDANTS

Anon
MICHIGAN CHEMICAL TO BOOST OUTPUT OF FLAME RETARDANTS
Text. Chem. Color. 8 (5): 12 (1976)

By Spring 1977 the latest expansion of Michigan Chemical Corporation's El Dorado, Arkansas facilities should be completed. Along with new air and water pollution control facilities, the company is adding a multimillion pound flame retardant facility, primarily for its fireMaster 680, a brominated organic chemical flame retardant for plastics that are used for TV sets and other electronic components. Michigan will also use the El Dorado facilities to produce other flame retardants for autos, furniture, etc.

47-0011
FLAME RETARDANTS

Anon
DURABLE FLAME RETARDANT
Text. Chem. Color. 8 (5): 45 (1976)

Poly-Gard 123, a water soluble complex phosphonate ester flame retardant, has been added to Hamilton-Auslander Mfg. Co.'s product line. Claimed to be non-toxic, containing no halogens, solvents or surfactants, the new product of this West Warwick, R.I. firm is advertised for knit, woven, spun or filament polyesters for use in children's sleepwear, household fabrics and camping equipment.

47-0012
FLUOROCARBONS

Anon
FLUOROCARBON REPORT DELAYED
Nature 261 (5556): 92 (13 May 1976)

The National Academy of Science's report on the possible damage to the earth's ozone layer has been delayed pending evaluation of new information which suggests that the threat may have been overestimated.

47-0013
FLUOROCARBONS

Anon
RUMOR AND CONFUSION FOLLOW OZONE THEORY REVISION
Sci. News 109 (19): 292 (8 May 1976)

The original theory of ozone depletion due to fluorocarbons has been reviewed by its authors and recent research indicates that the real danger from flurorcarbons acting on the ozone layer may be climatological modification rather than biological damage. The National Academy of Sciences and an interagency government task force are considering revising tentative recommendations regarding use of fluorocarbons. According to F.S. Rowland, who with M. Molina first airedthe ozone theory, chlorine nitrate (formed after chlorine is liberated from fluorocarbons) may react with the chlorine to prevent it from destroying as much ozone as originally predicted. Additionally, using the computer, Ruth Reck, a physicist with General Motors, has developed a series of models. Her data suggest only monor temperature changes from ozone depletion.

47-0014
FLUOROCARBONS

Murray, Chris
THEORY ADDS TO CONFUSION OVER OZONE LOSS
Chem. Eng. News 54 (22): 13-14 (24 May 1976)

New studies alternately confirm and contradict the ozone depletion theory earlier advanced by Rowland and Molina. One of the latest theories is that chlorine nitrate, formed by the reaction of chlorine liberated from fluorocarbons with stratospheric nitrogen oxides, may act as a sink for the liberated chlorine, cutting ozone depletion by 90%. Physical chemist D.D. Davis of the University of Maryland is developing models to study the effect of chlorine nitrate, first brought to light by A.L. Lazrus at the National Center for Atmospheric Research. Contrary to Rowland and Molina's first assumptions that chlorine nitrate breaks down rapidly, the new theory holds out for a greater persistence. Rowland and Molina see this reaction occurring in the lower stratosphere and believe still that fluorocarbons should be banned.

47-0015
FLUOROCARBONS

Anon
COMMENTARY
Aerosol Age 21 (5): 6, 18 (1976)

A brief review of the pros and cons of the ozone depletion theory mentions the chlorine nitrate theory and other studies that indicate a lowering of the depletion values first suggested by Rowland and Molina. The British are taking a cautious approach, awaiting additional research before banning the use of chlorofluorocarbons but suggesting that manufacturers continue to seek alternative compounds. In the U.S., EPA seeks funds for an interagency fluorocarbon research program; the National Bureau of Standards is looking for consistent test methods; and the consumer continues to buy aerosol products.

47-0016
FLUOROCARBONS

Anon
RISDON: AEROSOL PRODUCTION CONTINUED TO CLIMB IN 1974
Aerosol Age 21 (5): 24, 81 (1976)

Exclusive of the U.S. and Canada, aerosol production in the free world rose 14% in 1974 over that of 1973. The results of the 12th Annual World Aerosol Survey by the Risdon Manufacturing Company showed a production gain in all countries surveyed with the exception of Japan. Outside of the U.S., the largest aerosol production was reported by the United Kingdom and the second largest by West Germany. Hair sprays were the best sellers, accounting for 31.5% of total production in all countries surveyed.

47-0017
FLUOROCARBONS

Anon
AEROSOLS READY TO TAKE OFF AGAIN
Chem. Week 118 (21): 29 (26 May 1976)

Aerosol production (in the U.S.) in 1975 was 14% less than in 1974, according to a survey conducted by the Continental Group, but an increase of 20% is anticipated for 1976. In 1975, only 2.354 billion units were produced and filled. Of these, the largest category (1.075 billion units) covered personal products. The lower production rate was blamed on economic conditions as much as on the ozone depletion controversy.

Kohli, J. et al
THE METABOLISM OF HIGHER CHLORINATED BENZENE ISOMERS
Can. J. Biochem. 54 (3): 203-208 (1976)

While tri- and tetrachloro benzene isomers were metabolized in rabbits to the corresponding tri- and tetrachlorophenols, and pentachlorobenzene was metabolized to pentachlorophenol and 2,3,4,5-tetrachlorophenol, hexachlorobenzene yielded no phenolic on other metabolites.

47-0019
HYDRAZINE

Melvin, Walter W., Jr., and Johnson, William S.
A SURVEY OF INFORMATION RELEVANT TO OCCUPATIONAL HEALTH STANDARDS FOR HYDRAZINES
AD-A022 851. Environ. Health Lab. Kelly AFB Tex., EHL (K)-76-2 (9 March 1976)

This report summarizes Air Force use of hydrazines; exposure potential, experience and control techniques; instrumentation requirements, capabilities and limitations: spill management techniques: and management and control of acute exposures. It contains a review of American, German, Swedish, Russian and international agency for research on cancer workplace air standards for hydrazines and related compounds, and a selective literature review of recent important information deemed useful relative to establishing health standards for environmental exposure to the hydrazines, nitrosamines, nitrosomethylureas and nitrosomethylurethane. In addition, there is an appendix containing a comprehensive list of subject references on toxicity and biological effects of the hydrazines and their derivatives. [Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 343 (17 May 1976)]

47-0020
MODEL ECOSYSTEMS

Weber, K.
DEGRADATION OF PARATHION IN SEAWATER
Water Res. 10 (3): 237-241 (1976)

The results of this laboratory-scale experiment show that parathion in seawater is degraded through chemical hydrolysis and biological decomposition. One product of degradation, p-nitrophenol , was reduced by aquatic microorganisms and chemically changed to unidentified substances. A second degradation product deethylparathion (the toxic properties of which are unknown), appears immune to action by microorganisms and chemical hydrolysis and persists in the aquatic environment.

47-0021
MODEL ECOSYSTEMS

Porcella, D.B. et al
NUTRIENT DYNAMICS AND GAS PRODUCTION IN AQUATIC ECOSYSTEMS: THE EFFECTS AND UTILIZATION OF MERCURY AND NITROGEN IN SEDIMENT-WATER MICROCOSMS
PB- 250 704 (November 1975)

Sixteen sediment-water microcosms designed to allow complete gas, liquid, and solid mass balances of gases, nutrients, and mercury were studied under dark conditions or varying light intensity for a period of 189 days. Results indicated that the microcosm technique is very sensitive method of analyzing microbial dynamics in sediment water systems. Gas quantity and composition changes were easy to monitor and were especially sensitive to light and nutrient variations. Nitrogen fixation occurred in all lighted systems (blue-green algae nitrogen fixers, Anabaena, and others) and was adequate to insure that no nitrogen limitation occurred even though nitrogen limitation was imposed on the system. Sediments apparently did not act as a significant source of nitrogen. Iron and phosphorus were in excess and as such were closely linked as would be predicted on the basis of chemical equilibria. Non-equilibrium chemical behavior of such elements would apparently result only when appreciable amounts of the compound or element are utilized in growth. [Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 329 (17 May 1976)]

See: 47-0007, Benzidine

Anon
OPTICAL BRIGHTENER
Text. Chem. Color. 8 (5): 45 (1976)

Advertised as an optical brightener primarily for polyester fibers, Orco Synthrowite POA from Organic Chemical Corp., East Providence, R.I., is also useful for triacetates, polyamides, and polyacrylonitriles. The new liquid product, said to be stable to dilute acids and alkalines and stable in hydrosulfite, hypochloride or sodium chlorite liquors, gives a pinkish-tinge brilliant white result.

Kim, S.W. et al
EFFECT OF PHTHALATE PLASTICIZER ON BLOOD COMPATIBILITY OF POLYVINYL CHLORIDE
J. Pharm. Sci. 65 (5): 670-3 (1976)

Bis (2-ethylhexyl) phthalate, used as a plasticizer for polyvinyl chloride used for blood storage bags and other medical devices, is known to leach out of the PVC. Some previous studies have dealt with the effects of this plasticizer on certain blood elements, e.g., platelets. This study, which discusses the PVC surface, indicates that phthalate-contamination increases hydrophobicity, decreases albumin adsorption, and increases adsorption of γ-globulin and fibrinogen. Because of the last, there may be an increase in platelet adhesion and aggregation.

47-0024
PHTHALATES

Swinyard, Ewart A. et al
NONSPECIFIC EFFECT OF BIS (2-ETHYLHEXYL) PHTHALATE ON HEXOBARBITAL SLEEP TIME
J. Pharm. Sci. 65 (5): 733-4 (1976)

Pretreatment of rats and mice with bis(2-ethylhexyl) phthalate has been shown to increase the hexobarbital sleep time in these animals. In this study it was determined that this effect of the phthalate ester is related to its physical characteristics rather than to its pharmacological properties *per se*. The phthalate enlarged the animals' lipophilic reservoir for hexobarbital. The results were confirmed in tests in which olive oil, another lipophilic substance, was substituted for bis(2-ethylhexyl) phthalate.

Anon
M-R PLASTICS & COATINGS, INC.
Chem. Eng. 83 (10): 147 (10 May 1976)

The opening of a new 25,000-sq ft plant in Arlington, Texas for the manufacture of urethanes is announced by M-R Plastics & Coatings, Inc. of St. Louis. The new output will go to customers in the refrigeration and flotation industry.

Garro, A.J. et al
VINYL CHLORIDE DEPENDENT MUTAGENSIS: EFFECTS OF LIVER EXTRACTS AND FREE RADICALS
Mutat. Res. 38 (2): 81-8 (April 1976)

A previous study on the mutagenicity of vinyl chloride and some of its metabolites indicated a microsomal mixed function oxidase was involved in the stimulatory effects of hepatic extracts on mutagenesis (See: CATS 16-0105). This study fails to confirm the first theory, indicating rather that the enhancement of VC mutagenesis by hepatic extracts may be non-enzymatic in nature, or that a free radical generating system may be involved. The reported tests were made using *Salmonella typhimurium* strain TA1530.

Anon
PPG INDUSTRIES INC.
Chem. Eng. 83 (10): 80 (10 May 1976)

PPG plans to begin construction of a facility which will increase its output of 1,1,1- trichloroethane by more than 33 1/3% and double its capacity for vinylidene chloride.

47-0028
NITROSAMINES

Reznik, G. et al
CARCINOGENIC EFFECTS OF DIFFERENT NITROSO-COMPOUNDS IN CHINESE HAMSTERS. I. DIMETHYLNITROSAMINE AND N-DIETHYLNITROSAMINE
Br. J. Cancer 33 (4): 411-8 (1976)

Previous studies on the carcinogenic effects of various nitroso-compounds, which were conducted on Syrian golden hamsters or on European hamsters, showed diethylnitrosamine (DEN) to have a definite organotropy on the respiratory tract and dimethylnitrosamine (DMN) to be hepatotoxic as well as carcinogenic.

To compare the effects of nitrosamines on another member of this hamster family, DEN or DMN were given s.c. (1/5, 1/10, or 1/20 LD_{50}) to 320 Chinese hamsters. Tabulated data show the specific treatment, total dose, survival time, and the tumor distribution in Chinese hamsters treated with DEN and DMN. Observed organotropy was different from that in earlier studies. DMN primarily affected the liver; DEN, the digestive tract.

47-0029
NITROSAMINES

Hsieh, Shui-Tien et al
REACTION OF NITROSAMINES IN THE UDENFRIEND SYSTEM: PRINCIPAL PRODUCTS AND BIOLOGICAL ACTIVITY
Mutat. Res. 35 (1): 23-8 (April 1976)

Diethylnitrosamine (DEN) and nitrosopiperidine (NP) were incubated in the non-enzymatic, ascorbic acid-dependent, hydroxylating system of Udenfriend and their reaction products were isolated and characterized. The major product from DEN was N-nitroso-2-(ethylamino) ethanol; that from NP was N-nitroso-4-piperidone. Neither product was mutagenic to *S. typhimurium* TA 1535 without activation by a rat microsomal preparation.

Sellakumar, A. et al
EFFECTS OF DIFFERENT DUSTS ON RESPIRATORY CARCINOGENESIS IN HAMSTERS INDUCED BY BENZO(a)PYRENE AND DIETHYLNITROSAMINE
Europ. J. Cancer 12 (4): 313-9 (1976)

Syrian golden hamsters were used to determine the different carcinogenic effects of diethylnitrosamine (DEN) administered s.c. alone or DEN s.c. followed by intratracheally instilled ferric oxide, or ferric oxide treatment followed by DEN treatment. Results are detailed for six test groups and one control group. DEN alond induced laryngeal and tracheal papillomas in 58% of the hamsters and one lung adenoma. Different segments of the respiratory tract were affected when DEN was administered with ferric oxide. Because a lower number of upper respiratory tract tumors was observed when DEN and the oxide were administered simultaneously than when DEN treatment was followed by ferric oxide treatment, it is suggested that ferric oxide may promote DEN - induced tumor formation. The results of similar tests with benzo(a) pryene and dusts are reported.

NITROSAMINES

See: 47-0019, Hydrazine

47-0031
GENERAL INFORMATION

Anon
OSHA INTENDS TO SET WORKER EXPOSURE STANDARDS FOR HEXAVALENT CHROMIUM AS QUICKLY AS POSSIBLE
Chem. Eng. News 54 (21): 9 (17 May 1976)

Lung cancer in workers exposed to some Cr(VI) compounds and correlating animal studies have prompted OSHA's move to set worker exposure standards quickly. OSHA has requested additional information on distinguishing between safe and unsafe Cr(VI) compounds.

47-0032
GENERAL INFORMATION

Anon
KEPONE CARCINOGENICITY
Environ. Rep. 7 (1): 5 (3 May 1976)

Kepone is a potential liver carcinogen for rats and mice, according to the National Cancer Institute, where the animals were treated with the pesticide over an 80-week period. NCI, reporting its findings in a "Report on Carcinogenesis Bioassay of Technical Grade Chlordecone (Kepone)," available from Office of Cancer Communications, NCI, Bethesda, MD 20014, does not make any assumptions for human risk.

47-0033
GENERAL INFORMATION

Anon
SAFE HANDLING OF CHEMICALS
Farm Chem. 139 (2): 94 (1976)

Advertised as the first, very comprehensive, practical manual with up-to-date toxicity data, hazard data, and methods for safe handling and disposal of hazardous chemicals is the Toxic and Hazardous Industrial Chemicals Safety Manual for Handling and Disposal with Toxicity and Hazard Data. The 591-page manual, edited and published in 1975 by the International Technical Information Institute, Toranomon-Tachikawa Bldg. 1-6-5, Nishi-Shimbasi, Minato-ku, Tokyo, Japan 105, covers more than 700 chemicals, listed alphabetically. The price is $65, plus $14 for airmail.

47-0034
GENERAL INFORMATION

Anon
ENVIRONMENTALISTS AND CHEMICAL MAKERS ARE COMING CLOSER IN EFFORTS TO ARRIVE AT REASONABLE TOXIC SUBSTANCES LEGISLATION
Chem. Eng. News 54 (21): 9 (17 May 1976)

Both sides in the discussion are agreeing, at least privately, on the impossibility of testing every synthetic chemical before it is marketed. However, the chairman of the Council on Environmental Quality cautions against the chemical industry's taking complete responsibility for insuring the safety of new chemical products.

47-0035
GENERAL INFORMATION

Anon
FEDERAL ALERT--NEW LEGISLATION
Chem. Eng. News 54 (21): 21 (17 May 1976)

Senator Schweiker (R.-Pa.)has introduced legislation which would require the Secretary of Labor to alert employers to possible dangers from hazardous materials in their workplaces subsequent to NIOSH determination of the hazard.

47-0036
GENERAL INFORMATION

Anon
STATE TAKES OVER
Chem. Week 118 (21): 21 (26 May 1976)

After Allied Chemical closed its Aberdeen, Mississippi plant for production of Mirex, a suspected human carcinogen, the State of Mississippi re-opened the plant, hiring Allied's 13 former employees. The State faces a possible EPA ban on the use of Mirex, but has already accepted a $2.5-million order from the USDA.

47-0037
GENERAL INFORMATION

Anon
TRACE CONTAMINANTS
Environ. Rep. 7 (2): 16 (14 May 1976)

American Institute of Chemical Engineers, NYC, is selling (at $5 to members, $20 to non-members) its "Trace Contaminants in the Environment, S-149," which includes sections on the effects of trace metals on man and the environment, and the economic and regulatory considerations of trace elements.

47-0038
GENERAL INFORMATION

Asphalt Inst.
ASPHALT HOT-MIX EMISSION STUDY
PB-250 504 (March 1975)

The findings of this study may be summarized by the statement that there is no serious air pollution or employee health problem resulting from the use of petroleum-derived asphalt in hot-mixes. The findings are based on eight complete sets of emission samples taken at two hot-mix plants involving four asphalts from three refineries. The emission samples were taken following the discharge of the mix from the mixing chamber. In most of the samplings the immediate area was shrouded to concentrate the emissions, to exclude extraneous matter and to provide more uniform sampling conditions. Most of the air contaminants found in the emissions were at extremely low concentrations and all fell well within currently applicable limits established by the Occupational Safety and Health Administration (OSHA). Analysis of gaseous substances included carbon monoxide, nitrogen dioxide, sulfur dioxide, hydrogen sulfide, carbonyl sulfide, mercaptans, ozone, aldehydes, phenols and C2 to C14 hydrocarbons. Solid particulates were also collected and found to contain only trace amounts of polynuclear aromatic hydrocarbons and metal compounds, much lower than are typically found in emissions from other industrial and commercial sources. [Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 343 (17 May 1976)]

47-0039
GENERAL INFORMATION

Chugh, Y.P. et al
METALLIC AND NOMETALLIC MINING IN THE UNITED STATES. A HAZARD ANALYSIS
PB-250 595 (May 1974)

The report is the final of a study done by IIT Research Institute for the Bureau of Mines to identify the problem areas and technological inadequacies in non-coal (metal, nonmetal, stone, and sand and gravel) mining and processing systems that are the primary causes of death, injury, and occupational disease, and to make recommendations to improve safety and health in these operations. The findings and recommendations in the report are based on (1) Analyses of MESA injury and employment data for the period 1961-70, MESA fatality reports for underground non-coal mines (1968-72) and lost-time accident data for 1970-72 obtained from mining and processing operations (2) visits to a variety of noncoal mines and mills throughout the country to observe the operations and to study the safety organization and practices used in the industry and (3) interviews with industry and government representatives knowledgeable in the field of noncoal mining and processing safety and health. The report provides a comprehensive overview of safety and health problems. [Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 343 (17 May 1976)]

47-0040
GENERAL INFORMATION

Davis, Richard A. et al
TOXIC POINT DETERMINATION OF SELECTED HAZARDOUS MATERIALS
PB- 250 450 (December 1975)

'Toxic Point' is a term under consideration by the United Nations Group of Rapporteurs on the Packaging of Dangerous Goods. It is defined as the temperature at which the equilibrium concentration of vapor of a substance measured at 760 millimeters is equal to the LC50 of the substance. This is also referred to as the 'Temperature Threshold of Toxicity'. The report contains the 'Toxic Points' calculated for 57 substances. The calculations are shown together with the toxicity and vapor pressure data used therein. [Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, pp. 348-9 (17 May 1976)]

47-0041
GENERAL INFORMATION

Illinois Inst. for Environmental Quality
AIRBORNE MANGANESE HEALTH EFFECTS AND RECOMMENDED STANDARD
PB-251 130 (July 1975)

Recommendations for further studies;
Rationale for the proposed ambient manganese air standard;
Sources and levels of manganese in the environment;
Absorption and retention of manganese within the body;
Toxicology;
Health effects of manganese;
Health effects of manganese catalytic activity in atmospheric production of sulfuric acid and sulfates;
Direct effects of manganese fuel additives on health;
High risk populations with respect to direct manganese toxicity.
[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p. 349 (17 May 1976)]

47-0042
GENERAL INFORMATION

Anon
PANEL CALLS EPA OCEAN DUMPING RULES INADEQUATE
Chem. Week 118 (21): 18 (26 May 1976)

The panel on coastal waste management practices of the National Academy of Engineering has criticized EPA's current regulations for ocean dumping of municipal wastes, which EPA admits were not based on marine water. NAE's panel sees a need for more realistic consideration of such differences in fresh-water and oceans as the difference in dilution capacity. Tertiary treatment of wastes before disposal may, in some instances, be an over-treatment that may not be best for the environment.

47-0043
GENERAL INFORMATION

Anon
LABORATORY TESTS SHOW NO BENZENE-LEUKEMIA LINK
Chem. Week 118 (21): 32 (26 May 1976)

API-sponsored research at New York University's Institute of Environmental Medicine indicates that rats and mice inhaling 100 ppm or 300 ppm benzene did not develop leukemia, although counts of lymphocytes and white blood cells dropped in male animals. Additional studies will be conducted.

47-0044
GENERAL INFORMATION

Anon
A NEW PROCESS FOR RECOVERING LEAD FROM USED CAR BATTERIES...
Chem. Eng. News 54 (22): 12 (24 May 1976)

BuMines metallurgy research center, College Park, Md., announces a way of converting lead sulfate in battery scrap into lead oxide that can be smelted with no emission of sulfur dioxide. Calcium hydroxide is used to change the lead sulfate to calcium sulfate, which is removed as slag during smelting. Scrap lead, primarily from batteries, makes up about 50% of the U.S. lead supply annually.

47-0045
GENERAL INFORMATION

Iammartino, Nicholas R.
BENEFICIATED-ILMENITE PROCESS RECYCLES HCl LEACH LIQUOR
Chem. Eng. 83 (11): 100-1 (24 May 1976)

The "BCA Cyclic Process," developed by Benelite Corp. of America is the most promising method for upgrading ilmenite ore now available to TiO_2 manufacturers. Trade-named "Benelite," this beneficiated ore contains 92-96% TiO_2 and only 1-2% iron impurity but has certain properties different from those of natural rutile. The new product, suitable for the environmentally clean TiO_2 chloride process, may soon be followed by Benelite-S which can serve as a feedstock for making TiO_2 by the sulfate process. By October 1976, Kerr-McGee is expected to have a 100,000 metric ton/yr Benelite plant onstream in Mobile, Alabama. Five foreign plants should be in operation by 1979. Plant needs, economics, and process description are discussed.

47-0046
GENERAL INFORMATION

Long, Janice R.
TRADENAMES MAY HINDER JOB HEALTH EFFORTS
Chem. Eng. News 54 (22): 11 (24 May 1976)

At recent hearings, the Government Operations Subcommittee on Manpower and Housing found that the wide use of tradenames by manufacturers loath to divulge composition of their chemicals is hindering NIOSH's efforts to control occupational illness. Although most witnesses agreed that product compositions should be made public, a representative of the Manufacturing Chemists Association argued for on-the-job training of workers to avoid injury and recommended OSHA's establishing vertical standards for various industry segments.

47-0047
GENERAL INFORMATION

Anon
EPA STANDARDIZES CARCINOGEN GUIDELINES
Chem. Eng. News 54 (22): 4 (24 May 1976)

EPA has announced new procedures for regulatory decisions about suspected carcinogens. In standardizing its operations, EPA will judge as a cancer risk any substance that "causes a statistically significant excess incidence of benign or malignant tumors in humans or animals." EPA continues to deem even the smallest exposure to a carcinogen a potential risk.

47-0048
GENERAL INFORMATION

Anon
URANIUM MILL WASTES
Environ. Rep. 7 (2): 9-10 (14 May 1976)

The general public, even more than uranium miners, runs a great risk of developing lung cancer from radium-bearing (e.g., radon-222) wastes from uranium processing plants, according to a recent EPA report: "Potential Radiological Impact of Airborne Releases and Direct Radiation to Individuals Living Near Inactive Uranium Mill Tailings Piles," EPA-520/1-76-001, available free from EPA's Office of Radiation Programs, Environmental Analysis Division, 401 M Street, S.W., Wash., D.C. 20460.

In another free report, RI 8009, from BuMines, 4800 Forbes Ave., Pittsburgh, Pa. 15213, inactive storage piles or ponds for uranium wastes form another source of hazard from radium-bearing dusts.

48-0001
ACRYLONITRILE
(Uses)

Anon
PLASTIC FACES AN ACID TEST
Mod. Packag. 49 (5): 9 (1976)

Apple juice packaged in a new, transparent high-oxygen-barrier acrylonitrile can is under market test by Musselman Fruit Products Division of Pet, Inc. Made by American Can Co., the new shatterproof Tuf-Seal container weighs less than glass or metal cans and offers economical advantages over glass containers. It differs from previously used plastic containers, which have been low-oxygen barrier types. Musselman expects a 1-yr shelf life for its apple juice in the new acrylonitrile container, which can also be used for such other hot-filled acidic products as jams, jellies, relishes, etc., but not for retorted foods that require higher processing temperatures.

48-0002
ACRYLONITRILE

Anon
U.S. CHEMICAL INDUSTRY. THE PRODUCTS IT MAKES
Chem. Eng. News 54 (24): 35-8 (7 June 1976)

Terephthalic acid, ethylene oxide, and ethylene glycol were the only chemicals among the 50 biggest-volume chemicals that enjoyed an increase in production in 1975 over 1974. Acrylonitrile production dropped to 1.22 billion lb from 1.41 billion; vinyl chloride dropped to 4.2 billion lb from 5.62 billion. Among specialty organics, dioctyl phthalates dropped to 315.4 million lb from 395.2 million.

48-0003
ARSENIC

Forehand, T.J. et al
DETERMINATION OF ARSENIC IN SANDY SOILS
Anal. Chem. 48 (7): 999-1001 (June 1976)

Using the selective extraction of As(III) by benzene as a means of separating arsenic from antimony and bismuth plus atomic absorption spectrophotometry, the authors developed an interference-free method for the analysis of arsenic in sandy soils. Reported test results indicate that the method is sensitive and reproducible.

48-0004
ARSENIC

Walsh, Paul R. et al
LOSSES OF ARSENIC DURING THE LOW TEMPERATURE ASHING OF ATMOSPHERIC PARTICULATE SAMPLES
Anal. Chem. 48 (7): 1012-14 (June 1976)

Tests conducted with neutron activation and flameless atomic absorption procedures on atmospheric particulate samples collected in the marine environment and on synthetic sea salt matrices indicate that low temperature ashing procedures are not reliable for the analysis of arsenic. Significant arsenic losses occurred even at an RF power of 50 watts.

See also: 48-0041, General Information

48-0005
ASBESTOS

Piper, Allan
ASBESTOS. TINY STRAWS IN THE WIND
Nature 261: 271-2 (27 May 1976)

British researchers are arguing about the findings of an 8-year old Department of Health report, recently made public, that suggests that chrysotile (white asbestos) may be as much of a potential health hazard as crocidolite (naturally fine, blue asbestos). The report emphasizes the carcinogenic potential of asbestos, not only to workers but also to the general public, by pointing out that a definite carcinogenic threat exists from exposure to minimal levels of asbestos. Adding to the hazard potential is the fact that current milling practices yield a much finer chrysotile than previously produced.

48-0006
ASBESTOS

Wehner, Alfred P. et al
INCREASED LIFE SPAN AND DECREASED WEIGHT IN HAMSTERS EXPOSED TO CIGARETTE SMOKE
Arch. Environ. Health 31 (3): 146-53 (May/June 1976)

As part of an extensive research program on the cocarcinogenicity of various chemicals and cigarette smoke, 2-month-old Syrian golden hamsters, exposed three times/day for 10 minutes, 5 days/wk, for the duration of their lives, were divided into groups of 51 animals. For 7 hr/day, 5 days/wk, one group inhaled chrysotile asbestos, one group inhaled cobalt oxide, one group inhaled nickel oxide, and a fourth group was injected s.c. with diethylnitrosamine. Other groups received the chemicals and sham smoke.

Hamsters exposed to asbestos and smoke or to asbestos and sham smoke developed asbestosis and died sooner than hamsters exposed to the other chemicals, although those exposed to asbestos and smoke lived longer than those exposed to asbestos and sham smoke. In the other groups, those exposed to cigarette smoke lived significantly ($P<.01$) longer than the hamsters exposed to sham smoke and the untreated controls. Smoke-exposed hamsters had a mean body weight significantly ($P<.01$) lower than the sham-exposed hamsters. Apparently, the smoke retarded the onset of amyloidosis in the hamsters.

48-0007
ASBESTOS

Breedin, Patricia H. and Buss, David H.
FERRUGINOUS (ASBESTOS) BODIES IN THE LUNGS OF RURAL DWELLERS, URBAN DWELLERS, AND PATIENTS WITH PULMONARY NEOPLASMS
South. Med. J. 69 (4): 401-4 (1976)

In an attempt to determine if environmental exposure to asbestos by the general public (rather than just those who work with asbestos) might result in asbestos-caused carcinomas and lung disease, examination of the lungs of 100 patients at autopsy and of 24 individuals with different pulmonary neoplasms showed ferruginous (asbestos) bodies to be present. For the first time, the study group included rural as well as urban dwellers, and indicates that even a brief exposure to asbestos may induce some long-term hazards.

48-0008
ASBESTOS

Anon
HAZARDS OF ASBESTOS IN DENTISTRY
J. Am. Dent. Assoc. 92 (4): 777-8 (1976)

The Council on Dental Therapeutics has eliminated from its Acceptance Program periodontal packs in which asbestos is used as a binder because of the potential hazard to dental personnel, who may be exposed to airborne asbestos during the mixing of the packs. Another potential hazard to dental personnel is in laboratories, where large rolls of asbestos are kept for use as a lining material for casting rings and crucibles. Airborne asbestos is sometimes released when the rolls are cut. Soaking of asbestos liners in water may release fibers to enter the community sewage system.

Although patients are not in any danger from the use of asbestos-containing periodontal packs, the Council is questioning the use of asbestos filters in the preparation of drugs that dentists may inject parenterally. Animal studies show that asbestos injected parenterally can induce malignant mesotheliomas and other effects.

See also: 48-0039, General Information

McGeehan, Thomas J. and Maddock, Jerome T.
A STUDY OF FLAME RETARDANTS FOR TEXTILES
PB-251 441. Auerbach Associates, Inc. AUER-2200-TR-4, EPA/560/1-76/004 (February 1976)

As part of a program for identifying potential environmental hazards associated with various branches of technology, a review of the literature on flame retardants for textiles has been prepared. Covering the periods 1954-74, more than 500 primary documents and consultations with experts have been digested and cited. Chemicals and chemical treatments which are being used or have been proposed for producing flame retardant textiles are listed and discussed. Particular attention is given to toxicological data, to observations of health effects and to studies of environmental fates and effects of the materials which are used. The report is divided into major sections in which classes of natural and man-made textiles are considered separately. Several chemicals are identified as having their major application as flame retardants for textiles. These include certain halogenated monomers, halogenated phosphate esters, and formaldehyde derivatives of phosphorus and nitrogen compounds. The need for further studies of the fate and effects of these compounds is indicated.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.366 (24 May 1976)]

48-0010
FLUOROCARBONS

Angione, Ronald J. et al
STRATOSPHERIC OZONE AS VIEWED FROM THE CHAPPUIS BAND
Nature 261: 289-90 (27 May 1976)

An analysis of data from the solar constant observing program conducted by the Smithsonian Institution's Astrophysical Observatory from 1902 to 1961 has provided total ozone values in the stratosphere for the period 1912-1950. Large variations in total ozone suggest that instead of a single optimum level there may be a natural range in ozone amounts. This possibility coupled with insufficient data on past ozone levels and the natural biological processes involved casts doubts on man's ability to effect any permanent modification of the ozone layer.

48-0011
FLUOROCARBONS

Anon
SUPPORT FOR THE IDEA THAT CHLORINE NITRATE REDUCES OZONE LOSS...
Chem. Eng. News 54 (23): 14 (31 May 1976)

Computer calculations at the U.K. Atomic Energy Research Establishment indicate that the presence of chlorine nitrate in the upper atmosphere could reduce by a factor of four the previously predicted reduction of ozone by chlorofluorocarbons and might even increase ozone amounts. Chlorine nitrate might also have an even bigger impact because it removes some nitrogen oxides that are involved in the ozone destruction cycle.

Anon
TOXICOLOGISTS TAKE CANCER TESTING TO TASK
Chem. Week 118 (22): 31 (2 June 1976)

Attendees at the May conference of the American Industrial Hygiene Assn. in Atlanta criticized the testing procedures and goals proposed by the National Cancer Institute for determining carcinogenicity of chemicals, claiming that dosages used by NCI are too high, that hamsters are inappropriate test animals, etc.

Sidney Laskin of NYU's Inst. of Environmental Health, where bischloromethyl ether (BCME) was first identified as a carcinogen, reported that rats died of a rare squamous cell cancer of the nose after inhaling 10 ppm dimethylcarbomoyl chloride (DMCC), a chemical apparently more potent than BCME. More than 50 new patents on DMCC issued in 1975 indicate a potential increase in the use of this chemical, which is now used to a small extent in drugs and herbicides.

A skin cancer of the nose similar to that induced by DMCC was reported by DuPont as the result of studies in which rats and dogs inhaled hexamethylphosphoramide, a solvent used in making Kevlar, an aramid fiber used in the tire industry.

48-0013
HALOETHERS

De Fonso, Lester R. and Kelton, Stanton C.
LUNG CANCER FOLLOWING EXPOSURE TO CHLOROMETHYL METHYL ETHER. AN EPIDEMIOLOGICAL STUDY
Arch. Environ. Health 31 (3): 125-30 (May/June 1976)

When a high incidence of lung cancers was first noted in 1962 in the Philadelphia plant of a large chemical manufacturing company, an investigation finally disclosed chloromethyl methyl ether (CMME) contaminated with 0.5% to 4% bis(chloromethyl) ether (BCME) as the causative carcinogen. Since then, a number of studies have been conducted to reconstruct the particular situation at the plant between 1948 and 1972 and to determine the risk of lung cancer from CMME (BCME). Reported here are the results of the final epidemiological study made from 1973 to June 1974, which includes information on all male production workers employed from 1948 to 1972, comprising a cohort group of 2,285. Of these, the 669 thought to have been exposed to CMME (BCME) had a relative risk of cancer (on an age-specific basis) that was 3.8 times higher than that of the 1,616 unexposed workers. Despite data limitations, the survey disclosed dose-response relationships between lung cancer and intensity and/or exposure duration.

Tou, James C. and Kallos, George J.
POSSIBLE FORMATION OF BIS(CHLOROMETHYL)ETHER FROM THE REACTIONS OF FORMALDEHYDE AND CHLORIDE LON
Anal. Chem. 48 (7): 958-63 (June 1976)

Analysis by improved derivitization-gas chromatographic techniques (capable of detecting to the parts-per-trillion level) of the gaseous products formed by the reaction of formaldehyde with such commonly used chloride salts as sodium chloride, calcium chloride, ferric chloride, and magnesium chloride showed no bis(chloromethyl) ether (BCME) formation. The experiments were conducted because BCME, an identified carcinogen, has been reported to form spontaneously from such reactions.

48-0015
HEXACHLOROBENZENE

Yang, Raymond S.H. et al
HEXACHLOROBENZENE CONTAMINATION IN LABORATORY MONKEY CHOW
J. Agr. Food Chem. 24 (3): 563-5 (May/June 1976)

The finding that various samples of monkey chow were contaminated by hexachlorobenzene (from less than 1 ppb to 21.1 ppm in Purina and less than 1 ppb in Wayne monkey chow) is reported here to alert other researchers to monitor pesticide levels in every diet batch used for chronic studies in animals. Prolonged exposure to undetected HCB could alter the results of long-term toxicological studies.

48-0016
HEXACHLOROBENZENE

Laska, Anthony L.
DISTRIBUTION OF HEXACHLOROBENZENE AND HEXACHLOROBUTADIENE IN WATER, SOIL, AND SELECTED AQUATIC ORGANISMS ALONG THE LOWER MISSISSIPPI RIVER, LOUISIANA
Bull. Environ. Contam. Toxicol. 15 (5): 535-42 (1976)

Gas chromatographic analysis of field samples of water, soil, and certain aquatic organisms showed hexachlorobenzene (HCB) to be present more often in soil than hexachlorobutadiene (HCBD) in levels ranging from undetectable to almost 900 ppb. In water, the levels detected were below 2 ppb, except for one sample at Plaquemine where 90.3 ppb HCB was detected. Concentrations of from 71.8 to 379.8 HCB and from 112.8 to 827.3 ppb HCBD were found in whole body extracts of mosquitofish, representing in one instance a biomagnification of 172 times the concentration of HCB and 435 times the concentration of HCBD. Concentrations in crayfish are also reported.

See: 48-0015, Hexachlorobenzene

Greenhouse, Gerald
EVALUATION OF THE TERATOGENIC EFFECTS OF HYDRAZINE, METHYLHYDRAZINE, AND DIMETHYLHYDRAZINE ON EMBRYOS OF *XENOPUS LAEVIS*, THE SOUTH AFRICAN CLAWED TOAD
Teratology 13 (2): 167-78 (April 1976)

Hydrazine and its methylated derivatives were potent teratogens to *Xenopus laevis* embryos, with malformations developing during the neurulation period of embryogenesis. Hydrazine, (mono)methylhydrazine, and 1,1-dimethylhydrazine (UDMH) were teratogenic at concentrations over 10 mg/l. 1,2-Dimethylhydrazine (SDMH) was teratogenic at 50 mg/l or greater. At lower concentrations, embryos survived and developed into normal larvae. Tail kinks were the most common abnormalities, but all malformed embryos had abnormal notochords.

Anon
TDI PRICE HIKE SPREADS
Chem. Week 118 (22): 19 (2 June 1976)

Olin has followed through with its announced 27% price increase (up 11¢ to 51¢/lb) for toluene diisocyanate (See: CATS 42-0015), and a similar increase in TDI price by Mobay some weeks ago will be extended to other Mobay isocyanate products. Planned price increases for isocyanates by BASF Wyandotte, Allied and Carbide indicate that the price hike may be permanent.

48-0019
LIQUEFACTION AND GASIFICATION OF COAL

Katzer, James R. et al
AN EVALUATION OF AQUEOUS PHASE CATALYTIC OXIDATION
J. Water Pollut. Control Fed. 48 (5): 920-33 (1976)

Aqueous phase catalytic oxidation is compared with other physical-chemical wastewater treatments and is judged to be economically competitive for wastewater streams having high concentrations of organics.

The process is reviewed because of the potential environmental hazards from wastewaters from future large coal conversion and shale oil recovery plants, which will contain high concentrations of potentially carcinogenic nitrogen compounds and other pollutants. Components of the by-product water from the Synthane gasification of various coals are described.

48-0020
LIQUEFACTION AND GASIFICATION OF COAL

Fumich, George, Jr.
ENERGY FROM COAL
Combustion 47 (11): 7-14 (May 1976)

ERDA's research program designed for speedy development of coal conversion technology with a minimum effect on our environment is described in light of its relationship to the total U.S. energy program and the specific objectives of the coal liquefaction and gasification programs.

48-0021
LIQUEFACTION AND GASIFICATION OF COAL

Simone, A.A.
CLEAN FUEL FROM COAL PROCESS
Combustion 47 (11): 15-19 (May 1976)

The Clean Fuel from Coal (CFFC) process developed by C-E Lummus, a subsidiary of Combustion Engineering, Inc., will provide a liquid fuel for power generation that is low in sulfur and ash. Process description is illustrated by a simplified schematic block flow diagram. The CFFC process can be used with most domestic coals and for the production of products other than the low sulfur fuel oil discussed in this paper.

48-0022
LIQUEFACTION AND GASIFICATION OF COAL

Patterson, R.C.
THE COMBUSTION ENGINEERING COAL GASIFICATION PROGRAM
Combustion 47 (11): 28-34 (May 1976)

A material and flow schematic for the process development unit of the coal gasification system being developed by Combustion Engineering, Inc., for OCR (with additional funding from the Electric Power Research Institute) aids in describing this process, which is now in the final design stage. Test program should start in mid-1977 and be completed by the end of 1978.

Wayland, J.R. et al
HEAVY METALS IN ESTUARINE BENTHIC ORGANISMS AND SEDIMENTS: DATA AND MODEL
SAND-75-0518. Sandia Labs. (September 1975)

Coastal industrial development and subsequent heavy metal release requires an understanding of the environmental contamination that can result. A dynamic model has been developed in close association with a detailed environmental surveillance program of an estuarine ecosystem. The program and model trace the heavy metals from release into the water column and subsequent interactions with the air--water interface, pelagic zone, and sediments. The program and model also account for the interaction of phytoplankton, zooplankton, benthic organisms, and predators. The results of the calculations are compared to measurements taken in an estuarine ecosystem over a two-year period.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.376 (31 May 1976)]

48-0024
MODEL ECOSYSTEMS

Reish, D.J. et al
THE EFFECT OF HEAVY METALS ON LABORATORY POPULATIONS OF TWO POLYCHAETES WITH COMPARISONS TO THE WATER QUALITY CONDITIONS AND STANDARDS IN SOUTHERN CALIFORNIA MARINE WATERS
Water Res. 10 (3): 299-302 (1976)

Analyses of the toxicity of cadmium, chromium, copper, lead, mercury and zinc in sea water to polychaetous annelids were carried out. Mercury and copper were found to be the most toxic followed by zinc and chromium, with lead and cadmium being the least toxic of the elements studied. Evaluation of the concentration of the 6 elements in natural sediments and in the area of a sewage discharge shows that the levels of these elements exceed the toxic levels to the organisms studied.

Vance, B.D. and Maki, A.W.
BIOCONCENTRATION OF DIBROM BY *STIGEOCLONIUM PACHYDERMUM*
Bull. Environ. Contam. Toxicol. 15 (5): 601-7 (1976)

Previous reports of the bioaccumulation of pesticides by nontarget organisms, such as algae, and the potential impact of such bioaccumulation on the aquatic food chain, prompted this study on the effects of the pesticide, Dibrom (1,2-dibromo-2,2-dichloroethyl dimethyl phosphate), on *Stigeoclonium pachydermum*, a common green alga. Earlier studies had also shown Dibrom in sublethal concentrations reduced low oxygen tension tolerance in some aquatic animals.

In concentrations greater than 20 μg/ml, Dibrom inhibited the growth of *S. pachydermum;* produced a thick amorphous coating on the filaments; and caused the setae of the branch tips to disappear. The alga concentrated the Dibrom by absorption to the cell wall.

Appleby, Alan et al
COMMENT ON "ATMOSPHERIC HALOCARBONS: A DISCUSSION WITH EMPHASIS ON CHLOROFORM,"
By YUNG, Y.L., M.B. McELROY AND S.C. WOFSY
Geophys. Res. Lett. 3 (4): 237 (1976)

Commenting on the paper by Yung et al, published in Geophy. Res. Lett. 2: 397 (1975) in which the photodecomposition of perchloroethylene is suggested as a possible source of atmospheric chloroform, the authors refer to a paper to be published in late 1975 in "Environ. Letters" (Singh, H.B., D. Lillian, A. Appleby, and L. Lobban, "Atmospheric Formation of Carbon Tetrachloride from Tetrachloroethylene") in which they report that no significant amounts of chloroform resulted from the photooxidation of perchloroethylene. This was discussed by them at a 1974 conference, where they also mentioned that in another paper (Appleby, A., D. Lillian, H.B. Singh, and J. Kazazis, "Atmospheric Formation of Chloroform from Trichloroethylene," accepted for publication in Env. Sci. Technol.) they reported a significant production of chloroform from photooxidation of trichloroethylene. Appleby et al suggest, however, that perchloroethylene may be a source of atmospheric carbon tetrachloride.

See: 48-0002, Acrylonitrile

See: 48-0025, Perchloroethylene

See: 48-0018, Liquefaction and Gasification of Coal

48-0027
VINYL CHLORIDE

Ward, A. Milford et al
IMMUNOLOGICAL MECHANISMS IN THE PATHOGENESIS OF VINYL CHLORIDE DISEASE
Br. Med. J. (6015): 936-8 (17 April 1976)

In addition to causing hepatic angiosarcoma, vinyl chloride has been cited as the cause of acro-osteolysis in workers who cleaned the autoclaves after polymerization and, more recently, in another individual not so employed. Because the aetiology and pathogenesis of this VC disease, which involves not only acro-osteolysis but also Reynaud's phenomenon, thrombocytopenia, portal fibrosis, and impaired liver and lung functions, immunological investigations were conducted on 58 PVC workers. The described results indicate that this multisystem disorder is an immune complex disorder in which the immune response is triggered by adsorption of VC or a metabolite onto tissue or plasma protein.

48-0028
VINYL CHLORIDE

Smith, P.M. et al
HEPATIC ANGIOSARCOMA IN A VINYL CHLORIDE WORKER
Bull. N.Y. Acad. Med. 52 (4): 447-52 (May 1976)

Unlike the more than 38 previously reported cases of angiosarcoma induced by exposure to vinyl chloride monomer, where the average time of exposure was 16 years, the case described here involves a male worker who was exposed to VCM for only 3.5 years.

48-0029
VINYL CHLORIDE

Gauvain, Suzette
VINYL CHLORIDE
Proc. R. Soc. Med. 69 (4): 275-310 (1976)

Papers presented and discussed at the 12 Sept. 1975 meeting of the Section of Occupational Medicine covered the vinyl chloride problem, including VC and the production of PVC, a review of animal studies, clinical aspects of VC disease, epidemiological studies of PVC manufacturers and fabricators and primary angiosarcoma of the liver, epidemiological studies of VC health effects in the U.S., environmental monitoring, etc.

48-0030
VINYL CHLORIDE

Schlatter, Ch.
RISK TO CONSUMERS AND PVC WORKERS FROM VINYL CHLORIDE
Schweiz. Med. Wochenschr. 106 (19): 647-50 (8 May 1976) (German)

Since 1930, there have been 42 cases of angiosarcomas reported among the 20,000 to 40,000 exposed workers, but industry efforts to lower the exposure levels in PVC factories over the last two years are expected to cut the risks of liver cancers among workers and to eliminate the future possibility of vinyl chloride disease. Because the amount of VC from PVC-packaged food to which the consumer may be exposed is infinitesimal compared to the carcinogenic threshold dose, such exposure is not viewed as a serious health hazard.

48-0031
VINYL CHLORIDE

Maltoni, C. et al
VINYL CHLORIDE CARCINOGENESIS: CURRENT RESULTS AND PERSPECTIVES
Med. Lav. 65 (11-12): 421-44 (1974)

A review of experiments performed at the Bologna Institute of Oncology and Tumour Center is presented. Inhalation of VC produced, in rats, a range of carcinomas and sarcomas in body sites including the brain, liver, lungs, and skin.

Other experimental and epidemiological information on VC-related carcinogenesis is reviewed.

48-0032
VINYL CHLORIDE

Anon
TENNECO AWAITS APPROVAL
Chem. Week 118 (22): 14 (2 June 1976)

Tenneco Chenicals will have to wait until the Texas Air Control Board meets on 24 June to learn if the company can expand capacity of its Pasadena, Texas, PVC plant to 500 million lb/yr from its current level of approximately 240 million lbs.

Anon
VCM, PVC TABS MOVE UP
Chem. Week 118 (22): 19 (2 June 1976)

Conoco announces a 1¢/lb increase (to 13.6¢/lb, f.o.b. Lake Charles, La.) for VCM, effective 1 July. At that time also, Diamond Shamrock will also impose a 1¢/lb hike on its PVC resins and compounds.

VINYL CHLORIDE

See: 48-0002, Acrylonitrile

48-0034
NITROSAMINES

Lijinsky, William
HEALTH PROBLEMS ASSOCIATED WITH NITRITES AND NITROSAMINES
AMBIO 5 (2): 67-72 (1976)

Brief review of the sources and properties of nitrites, their effects on health, reactions leading to the formation of nitrosamines, and the dangers of nitrosamines: the formation of nitrosamines in food and in vivo, and the carcinogenicity of the widely-used N-nitroso compounds, which include potent carcinogens. N-nitroso compounds can act transplacentally and by any route of administration. If present in the milk or urine of exposed animals or people, they could be transmitted to others, such as children through milk. One way to drop the possibility of health hazards from these chemicals is to restrict the amount of residual nitrite in cured meat and fish.

48-0035
NITROSAMINES

Taylor, H.W. et al
NITRITE AND NITROSAMINES: A POSSIBLE SOURCE OF CARCINOGENS FOR MAN
CONF-750721-1 (1975) 22p.

N-nitrosamines comprise a group of chemicals that are potent carcinogens in most species of animals tested, and, although they occur minimally in nature, precursor amines and sodium nitrite form N-nitrosamines in the stomach of monogastric animals. Man is exposed to numerous sources of amines, many of which are necessary for life, through foodstuffs, medicines, and chemicals in the environment, and in more developed countries he is exposed to relatively large amounts of sodium nitrite from food processing. Several combinations of amines and nitrite have been tested and shown to produce the same tumors as the respective performed carcinogens in laboratory rats. The importance of nitrosamines, both as primary carcinogens and perhaps as cofactors with other environmental agents, remains to be elucidated, but these compounds certainly must be considered as a factor in the apparent increase of cancers in the human population.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.296 (3 May 1976)]

Zingmark, P-A, and Rappe, C.
ON THE FORMATION OF N-NITROSO-DIETHANOLAMINE FROM A GRINDING FLUID UNDER SIMULATED GASTRIC CONDITIONS
AMBIO 5 (2): 80-1 (1976)

Because of the recent concern over the potential carcinogenicity of nitrosamines and the chance that nitrosamines can be formed in vivo from drugs and nitrite and from the reaction of ingested amines and nitrite, the use of amine additives in industrial oils was a cause for concern as a source of N-nitrosamine formation. Under simulated gastric conditions, a typical grinding fluid, consisting of triethanolamine, sodium nitrite, water, and fluorescein color, was found to yield N-nitrosodiethanolamine. The fluid was incubated at 37°C for 1 hr in buffer solutions at different pH values, and the yield of nitrosamine at pH2 from 1 ml of grinding fluid was 13 mg or about 1000 times more than the amount of N-nitrosodimethylamine found in some foods. Workers inhaling or swallowing the mist formed, when the components of the grinding fluid are in water droplets around the machines, could run the risk of impaired health.

48-0037
NITROSAMINES

Herzog, John and Farber, John L.
INHIBITION OF RAT LIVER RNA POLYMERASES BY ACTION OF THE METHYLATING AGENTS DIMETHYLNITROSAMINE *IN VIVO* AND METHYL METHANESULFONATE *IN VITRO*
Cancer Res. 36 (5): 1761-70 (1976)

The effect of dimethylnitrosamine (DMN) on rat liver RNA synthesis is discussed and DMN is shown to inhibit the activity of the solubilized and partially purified nRNA polymerases but to leave the chromatin template intact. No correlation with carcinogenesis and the reported disturbances in RNA metabolism is suggested.

48-0038
NITROSAMINES

Betteridge, D. et al
GAS-LIQUID CHROMATOGRAPHY/ULTRAVIOLET PHOTOELECTRON SPECTROSCOPY AND THE PHOTOELECTRON SPECTRA OF NITROSAMINES
Anal. Chem. 48 (7): 1078-84 (June 1976)

Brief discussion of the photoelectron spectra of various nitrosamines illustrates the advantages of combined GC-PES analytical techniques.

NITROSAMINES

See: 48-0006, Asbestos

48-0039
GENERAL INFORMATION

Yoon, Soo-Choon et al
LEAD RELEASE FROM GLAZES AND GLASSES IN CONTACT WITH ACID SOLUTIONS
Am. Ceram. Soc., Bull. 55 (5): 508-10, 12 (1976)

Because lead leached from ceramic glazes and glasses made in the U.S. or abroad has been implicated in lead poisoning recently, the effects of 11 acidic beverages (pH 1.75 to 6.90) on specially-prepared ceramic cups were investigated. More lead was released from glazes in contact with beverages in the lower pH range. Longer reacting times and higher reacting temperatures also increased the lead release.

48-0040
GENERAL INFORMATION

Anon
LEAD POISONING...
Environment 18 (4): 24 (May 1976)

Lead poisoning in 50 children, 7 of whom were hospitalized, was traced to lead carried home on the clothes of parents who worked in a lead smelter in Memphis. Lead poisoning symptoms were noted in 36% of 78 smelter workers; 63% had dangerously high levels of lead in their blood.

Via their clothing, workers can also bring into the home chemicals that cause asbestosis, berylliosis, and chlor-acne.

48-0041
GENERAL INFORMATION

Hittle, Douglas C. and Stukel, James J.
FUME EMISSIONS FROM COAL-TAR PITCH
AD-A022 844. Construction Eng. Res. Lab. (Army), Champaign, Ill. CERL-technical-Ms-E-84 (January 1976)

This study was intended to characterize the chemical and physical nature of coal-tar fumes emitted from spreading applications of coal tar and to determine a first estimate of the emission factor for coal-tar fumes under conditions similar to those found in the field. Three separate experiments were performed. The first resulted in the determination of a coal-tar fume particle size distribution. The second experiment resulted in the identification of the primary compounds found in collected tar fumes and a determination of their relative concentration. The third resulted in an estimate of coal-tar fume emission rates under various air flow conditions. These results may permit determination of the potential hazards to workers health and air quality associated with coal-tar-pitch products.

48-0042
GENERAL INFORMATION

Anon
A RARE FORM OF LIVER CANCER...
Environment 18 (4): 21 (May 1976)

Cases of angiosarcoma discovered in some Wisconsin residents were probably caused by the calcium arsenate insecticide to which the victims were exposed years ago, when they were growing up on potato and dairy farms. Angiosarcomas have been reported in vineyard workers also exposed to a similar arsenical pesticide.

49-0001
ACRYLONITRILE

Anon
PRICES OF ACRYLONITRILE AND ACRYLIC FIBERS RISE
Chem. Week 118 (24): 27 (16 June 1976)

As of 1 July, Monsanto is raising the price of acrylonitrile by 1.5¢ to 26.5¢/lb. Price of Du Pont's acrylic staple increased 8% as of 26 June; Dow-Badische's will go up by 5¢/lb as of 12 July.

49-0002
ACRYLONITRILE

Henning, H.F.
TOXICITY OF POLYMERS AND POLYMER RAW MATERIALS
Chem. Ind. (London) (11): 463-4 (5 June 1976)

In a brief presentation at a joint meeting of the Plastics and Polymer Group and the London Section of the SCI and the Macromolecular Group of the CS in London on 28 Oct. 1975, the author discussed toxicity of chemicals via ingestion, inhalation, skin absorption and skin contact. Among the polymer raw materials, acrylonitrile, vinylidene chloride, vinyl chloride, and isocyanates are mentioned as chemicals with systemic effects ensuing from absorption through the lungs. Although acrylonitrile is highly toxic, its threshold limit of 20 ppm os based primarily on animal studies. Vinylidene chloride, with a threshold limit of 10 ppm, causes unconsciousness at high levels; chronic exposure to 25 ppm can cause liver and kidney damage. In its liquid form, it is very irritating to the skin and eyes.

49-0003
ACRYLONITRILE

Wharton, F.D., Jr., and Levinskas, G.I.
TOXICOLOGICAL STUDIES ON NITRILE BARRIER POLYMERS
Chem. Ind. (London) (11): 470-4 (5 June 1976)

Migration and toxicological studies conducted on the nitrile barrier polymer container, marketed by Monsanto under the tradename LOPAC, indicate the material to be non-hazardous to health. Acrylonitrile was identified as one of the migrants from the containers, but a bitter almond taste identified in early tests was traced to HCN migration. Acrylonitrile was not the direct source of the HCN, however, and pretreatment of the polymer with formaldehyde controlled the HCN migration, according to this paper presented at a joint meeting of the Plastics and Polymer Group and the London Section of the SCI and the Macromolecular Group of the CS in London on 28 Oct. 1975.

49-0004
ACRYLONITRILE

Anon
BOTTLE RULES CAPPED
Chem. Week 118 (25): 23 (23 June 1976)

Despite the National Resources Defense Council's objections, FDA has issued "final interim" rules for acrylonitrile beverage bottles, which require monomer leaching be restricted to no more than 0.003 mg/sq. in. of food contact surface.

Amasa, S.K.
ARSENIC POLLUTION AT OBUASI GOLDMINE, TOWN, AND SURROUNDING COUNTRYSIDE
Environ. Health Perspect. 12: 131-5 (December 1975)

Mineworkers in the goldmine and residents in the town of Obuasi in Ghana have high levels of arsenic in their hair. Arsenic has been detected in surrounding soils and waters and even in some foods. Previous research has shown that arsenic levels 2.5 miles from the source have injured vegetation and inhibited plant growth.

49-0006
ARYL PHOSPHATES

Johnson, M.K.
THE DELAYED NEUROPATHY CAUSED BY SOME ORGANOPHOSPHORUS ESTERS: MECHANISM AND CHALLENGE
CRC Critical Reviews in Toxicology, pp. 289-316 (June 1975)

Biochemical mechanisms involved in delayed neurotoxicity caused by tri-σ-cresyl phosphate (TOCP) and related compounds are reviewed, covering 131 references. A brief discussion of the chronic toxicity of TOCP is included.

49-0007
ARYL PHOSPHATES

O'Neill, Leonard A.
TOXICITY AND POLLUTION PROBLEMS IN THE PAINT INDUSTRY
Chem. Ind. (London) (11): 464-6 (5 June 1976)

In a paper presented at a joint meeting of the Plastics and Polymer Group and the London Section of the SCI and the Macromolecular Group of the CS in London on 28 Oct. 1975, the polymeric binder in paints was identified as the least source of toxicity among paint components. More potentially hazardous are solvents and additives used. In Britain, however, such additives as tritolyl phosphate (tricresyl phosphate) and chlorinated diphenyl plasticizers are seldom used now. Precautions must be taken for certain paints (polyurethane paints, epoxy resin paints, vinyl chloride paints, and paints containing a combination of formaldehyde and chlorine resins) that use polymeric binders.

The potential presence of free VC monomer in certain paints is suggested as a potential hazard, and the possible greater use of vinylidene chloride as a copolymer component should be watched since there have been some reports that vinylidene chloride might give rise to a carcinogenic hazard. The possible formation of bischloromethyl ether (BCME) from the reaction of formaldehyde and chlorine degradation products must be considered, although tests to date have shown no undesirable concentrations of BCME. In two-pack polyurethane paints the level of toluene diisocyanate or hexamethylene diisocyanate used as adducts must be carefully controlled.

49-0008
ASBESTOS

Berry, J.P. et al
PULMONARY MINERAL DUST
Am. J. Pathol. 83 (3): 427-56 (June 1976)

By means of electron microscopy, electron microanalysis, and electron microdiffraction the intrapulmonary mineral deposits found in 90 patients were studied for their chemical, morphologic, and crystalline properties. In the study of pneumoconiosis, the reported results can be useful as a means of distinguishing asbestos bodies from ferruginous bodies and of more directly classifying the various asbestos fibers found.

49-0009
ASBESTOS

Iammartino, Nicholas R.
NEW ION-EXCHANGE MEMBRANE STARS IN CHLOR-ALKALI PLANT
Chem. Eng. 83 (13): 86-8 (21 June 1976)

A detailed description of the new Asahi Chemical membrane process for chlor-alkali manufacturing includes performance and cost comparisons for the new membrane process versus the asbestos-diaphram process and the mercury process.

Kilbey, Brian J.
COMPARATIVE ASPECTS OF MUTAGENESIS IN *DROSOPHILA* AND EUKARYOTIC MICROORGANISMS
Hereditas 82: 43-50 (1976)

In this review of work comparing the mutagenic effects of x-rays and chemicals, including ethyleneimine and hydrazine, the storage effect and mutagen specificity are discussed.

49-0011
FLAME RETARDANTS

Anon
LeBLANC RESEARCH CORP.'s ANNUAL SYMPOSIUM REVIEWS DEVELOPMENTS IN TEXTILE FLAMMABILITY
Text. Chem. Color. 8 (6): 21-5 (June 1976)

Summaries of 16 reports presented at the textile flammability symposium are contained in this review. The reports were concerned with such topics as the work of the Consumer Product Safety Commission, the toxicology of tris(dibromopropyl) phosphate, new flame retardant treatments and fiber blends, and flammability testing methods.

49-0012
FLAME RETARDANTS

Anon
FIRE RETARDANTS
Mod. Plast. 53 (6): 99 (1976)

The Proceedings of the 1975 International Symposium on Flammability and Fire Retardants are now available from Technomic Publishing Co., Westport, Connecticut at $25 per copy.

Aviado, Domingo M.
TOXICITY OF AEROSOL PROPELLANTS IN THE RESPIRATORY AND CIRCULATORY SYSTEMS
X. PROPOSED CLASSIFICATION
Toxicology 3: 321-32 (1975)

Propellants are evaluated relative to the intensity of responses in the circulatory and respiratory systems of animals, and are classified according to the degree of toxic effects on these systems. Fluorocarbons considered include trichlorofluoromethane (FC-11), dichlorofluoromethane (FC 12), and trichlorofluoroethane (FC 113), which are low-pressure propellants of high toxicity, plus some of intermediate toxicity (FC 114 and FC 142b). Also included are some high pressure propellants of intermediate toxicity (e.g., FC 12 and FC 22) and of low toxicity (FC 115 and FC 152a). (See also: CATS 3-0026).

See: 49-0007, Aryl Phosphates

49-0014
HEXACHLOROBENZENE

Carlson, Gary P. and Tardiff, Robert G.
EFFECT OF CHLORINATED BENZENES ON THE METABOLISM OF FOREIGN ORGANIC COMPOUNDS
Toxicol. Appl. Pharmacol. 36 (2): 383-94 (1976)

Of the 5 chlorinated benzenes tested in mice, hexachlorobenzene was found to be the least toxic, the animals tolerating a dose of 3000 mg/kg. Hexachlorobenzene produced no liver damage as measured by serum isocitrate dehydrogenase. The authors used hexobarbital sleeping times to study the possible effect of the chlorinated benzenes on xenobiotic agents. Hexachlorobenzene did not alter the sleeping times after 14 days of exposure, but during the recovery period a decrease in the sleeping times was noted. It appears that, even at low doses, these chlorinated benzenes are capable of affecting the systems responsible for metabolizing foreign organic compounds.

49-0015
HEXACHLOROBENZENE

Environmental Protection Agency, Office of Toxic Substances
ENVIRONMENTAL CONTAMINATION FROM HEXACHLOROBENZENE
PB 215 874/4WJ (EPA/560/6-76/014): 34p. (20 July 1973)

A series of episodes around the world resulted in recognition of the fact that man and his environment are being exposed to hexachlorobenzene (HCB). The finding of grossly elevated levels in domestic animals, such as at Geismar, Louisiana, elicited the attention of local State, and Federal officials. The report summarizes available information in the production, use, and toxicity of HCB and presents conclusions and activities undertaken to gain a fuller understanding of the problems associated with this substance so as to formulate a regulatory posture on this toxic substance.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.393 (7 June 1976)]

49-0016
HYDRAZINE

Pangburn, Michael K.
EFFECTS OF EXPOSURE TO MONOMETHYLHYDRAZINE AND 1,1-DIMETHYLHYDRAZINE ON THE IMMUNOLOGICAL RESPONSIVENESS OF GUINEA PIGS.
AD-A024 165/3WJ (AMRL-TR-76-7): 13p. (February 1976)

The humoral immune response of guinea pigs was measured by determining serum antibody titers to bovine serum albumin. Cell mediated immunity was tested in vivo by evaluating the delayed hypersensitivity to tuberculin. Three compounds were tested. One, 6-mercaptopurine (6MP), was a known immunosuppressive drug. Its administration resulted in significantly depressed humoral and cellular responses, demonstrating that these methods could be used to evaluate immunosuppression in routine toxicity testing. Exposure to the two toxic rocket propellants monomethylhydrazine and 1,1-dimethylhydrazine resulted in a similar but less pronounced decrease in immune responsiveness.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.411 (14 June 1976)]

49-0017
HYDRAZINE

Sterman, M. B. et al
EFFECTS OF CNS MANIPULATIONS ON SEIZURE LATENCY FOLLOWING MONOMETHYLHYDRAZINE ADMINISTRATION IN THE CAT.
AD-A024 098/6WJ (AMRL-TR-75-80): 11p. (January 1976)

The objective of this study was to determine the influence of intracranial electrode placement upon the seizure response to monomethylhydrazine, and to replicate previous findings on the effects of EEG operant conditioning on this response. Thirty cats were studied, 10 in each of 3 different experimental groups. The dependent variable was latency in minutes to generalized motor seizures. The three experimental groups were: (1) an unoperated group, (2) an operated group with cortical and subcortical electrodes, and (3) an operated group as in (2), but provided additionally with sensorimotor rhythm (SMR) EEG operant conditioning. The findings suggested that (1) some aspect of the procedure associated with central nervous system electrode implantation increased susceptibility to MMH-induced seizures, (2) unoperated animals had individual differences in seizure susceptibility, but were significantly more resistant to MMH toxicity than operated animals, and (3) SMR-trained operated animals had individual differences in response to training, but were also more resistant to MMH toxicity.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.418 (June 1976)]

See: 49-0010, Ethyleneimine

Anon
POLYMERIC ISOCYANATE TABS INCREASED BY UPJOHN
Chem. Week 118 (24): 27 (16 June 1976)

Effective July 15, 1976, prices for Upjohn's PAPI polymeric isocyanate products increased 3¢/lb.

ISOCYANATES

See: 49-0002, Acrylonitrile

See: 49-0007, Aryl Phosphates

See also: 49-0022, Polyurethanes

Clark, B.R. et al
CHEMICAL-BIOLOGICAL CHARACTERIZATION OF COAL CONVERSION LIQUIDS.
CONF-760402-1. Oak Ridge Natl. Lab., Tenn. (1976)

Product liquids and organic concentrates obtained from aqueous effluents are chemically fractionated and analyzed chromatographically. Fractions are subjected to biological testing to determine their toxic and mutagenic potentials; those fractions found to be active are further analyzed in order to focus on specific compounds which may produce the biological activity. Analytical techniques include GLC chromatography with sulfur and nitrogen selective detectors; chemical identifications are made from cochromatographic and GC-MS data. Some mutagenicity test results for various fractions of COED product oil are presented.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.432 (21 June 1976)]

M & T Chemicals, Inc.
TRY APOCURE. WHO NEEDS MOCA?
Mod. Plast. 53 (6): 6-7 (1976)

Now available in limited quantities from M & T Chemicals is Apocure, an aromatic diamine, that is advertised as a replacement for MOCA for use as a curing agent for high resiliency foams and costable elastomers. Preliminary oral and dermal toxicological data are available from the company.

Draggan, S.
ASSESSMENT OF THE MICROCOSM AS A TOOL FOR ESTIMATION OF ENVIRONMENTAL TRANSPORT OF TOXIC MATERIALS
CONF-750838-2 Oak Ridge Natl. Lab., Tenn. (August 1975)

Increases in toxic chemical dissipation makes their control in the environment desirable. Environmental control of these substances requires thorough understanding of the functioning of ecosystems potentially receiving chemical input, and of the behavior and fate of released chemicals. Terrestrial microcosms are useful tools in chemical fate studies; however, critical assessment of their ability to simulate ecosystem processes has been limited. This paper provides a rationale for evaluating the utility of microcosms for prediction of chemical fate in natural ecosystems.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.392 (7 June 1976)]

MODEL ECOSYSTEMS

See also: 49-0029, Vinyl Chloride

Anon
URETHANE FOAM IS BOUNCING BACK; SAME GOES FOR TDI PRICING
Mod. Plast. 53 (6): 12 (1976)

The demand for urethane foams has made a strong comeback after a substantial drop in tonnage last year. Toluene diisocyanate (TDI) production is being increased with growth forecast through 1981. A sharp price increase in TDI pricing may be partially due to pollution abatement costs.

POLYURETHANES

See: 49-0007, Aryl Phosphates

49-0023
VINYL CHLORIDE

Stafford, John
THE VINYL CHLORIDE MONOMER HEALTH PROBLEM
Chem. Ind. (London) (11): 466-70 (5 June 1976)

This brief review of the VC health problem, presented at a joint meeting of the Plastics and Polymer Group and the London Section of the SCI and the Macromolecular Group of the CS in London on 28 Oct. 1975, points out the efforts of the UK in containing the problem and stresses the need for international cooperation in conducting epidemiological and other surveys leading to an assessment of a safe threshold level and a definition of other potential health hazards from VC.

49-0024
VINYL CHLORIDE

Watanabe, P.G. et al
FATE OF [^{14}C] VINYL CHLORIDE AFTER SINGLE ORAL ADMINISTRATION IN RATS
Toxicol. Appl. Pharmacol. 36 (2): 339-52 (1976)

To assess the potential hazard of ingested VC, a 72-hour study was made of the routes and rates of elimination of [^{14}C] vinyl chloride given to rats in single oral doses of 0.05, 1.0 and 100 mg/kg. At the two lower doses, a greater percentage of the dose was expired as CO_2 rather than as VC, while the reverse held for the 100 mg/kg dose in which approximately 67% was eliminated by the lungs as VC. At the 0.05 mg/kg dose, over 68% was metabolized and eliminated in the urine; at the 1.0 mg/kg dose, this percentage was over 59%. Total recovery was highest for the lowest dose. It was concluded from these and other results that the fate of ingested VC in rats is dose-dependent.

Strelow, Roger
VINYL CHLORIDE. RECOMMENDED PROCEDURES FOR DISPOSAL OF AEROSOL CANS
Fed. Regist. 41 (112): 23226-7 (9 June 1976)

High temperature incineration (except for products containing heavy metals), burial in a State-approved chemical (or hazardous) waste landfill, or burial in a separate area of a State-approved sanitary landfill are recommended methods for disposal of vinyl-chloride containing aerosol cans. These procedures are announced primarily for the holders of large quantities of such cans, the use of which has been banned by CPSC. As of 5 Sept. 1975, an estimated 3.3 million cans of VC aerosols were thought to exist.

49-0026
VINYL CHLORIDE

Anon
PATENTS SHOW WAY TO REMOVE RESIDUAL VCM
Chem. Week 118 (24): 32 (16 June 1976)

According to U.S. Pat. 3,956,249, Tenneco Chemicals' method of removing residual VC from PVC resins involves contacting the wet cake with steam. Goodrich continuously steam-strips VC from its PVC resins, according to patent applications.

49-0027
VINYL CHLORIDE

Anon
WORKERS EXPOSED TO VINYL CHLORIDE EXHIBIT SKIN DISEASE CHANGES...
Chem. Eng. News 54 (25): 20 (14 June 1976)

Skin capillary changes in 39.5% of 129 workers in a vinyl chloride plant (17% with definite changes, and 22.5% with minimal changes) may be the means for studying scleroderma -- a form of arthritis with excess production of collagen -- and may give early warning of vinyl chloride disease. This information was announced by Dr. H.R. Maricq of the Medical Univ. of S. Carolina in Charleston at a recent meeting of the Arthritis Foundation in Chicago.

49-0028
VINYL CHLORIDE
(Uses)

Martino, Robert
VINYL DRESSES UP FOR NEW ERA IN SIDING
Mod. Plast. 53 (6): 34-7 (1976)

The advantages of PVC house siding can be augmented now by the advent of dark colors and coextrusion. On the conservative side, perhaps, is a growth estimate of 160,000 metric tons of vinyl siding in 1985, compared to the 32,000 tons used in 1975.

49-0029
VINYL CHLORIDE

Anon
VINYL CHLORIDE/WATER
Environ. Rep. 7 (4): 32 (21 June 1976)

Publication EPA-600/3-76-001, "Dynamic Behavior of Vinyl Chloride in Aquatic Ecosystems," sees the possibility of long-term storage of low levels of VC in sediments under extreme conditions, although extremely high VC levels would be needed for significant concentrations to persist in aquatic ecosystems. Publication is offered by Environ. Res. Lab., ORD, EPA, Athens, Ga. 30601.

49-0030
VINYL CHLORIDE

Infante, Peter F. et al
GENETIC RISKS OF VINYL CHLORIDE (Letter to Editor)
Lancet 1 (7972): 1289-90 (12 June 1976)

Responding to a request for clarification of the data collection method used in their previously reported study (See: CATS *45-0029), the authors explain how their interviews were conducted and include a table of data for age-specific fetal mortality-rates before adjustment for time periods before and after the husband's exposure to vinyl chloride.

See: 49-0002, Acrylonitrile

See: 49-0007, Aryl Phosphates

See: 49-0002, Acrylonitrile

49-0031
NITROSAMINES

Friedman, M.A. et al
SUPPRESSION OF DIMETHYLNITROSAMINE METABOLISM AND TOXICITY BY NITROSOSARCOSINE AND OTHER NITROSAMINES
Toxicol. Appl. Pharmacol. 36 (2): 395-401 (1976)

This study on rats treated with more than one nitroso compound was conducted to observe their combined effects on rat liver. Each of the following compounds--diethylnitrosamine, dibutylnitrosamine and nitrososarcosine--affected the metabolism of dimethylnitrosamine and showed inhibition of RNA, DNA and protein methylation.

49-0032
NITROSAMINES

Fong, Y.Y. and Chan, W.C.
METHODS FOR LIMITING THE CONTENT OF DIMETHYLNITROSAMINE IN CHINESE MARINE SALT FISH
Food Cosmet. Toxicol. 14 (2): 95-8 (April 1976)

The dimethylnitrosamine (DMN) content of sea water fish, which was dried and salted for dietary use, was investigated. Better processing methods are outlined which would reduce the level of DMN in the product. Pure sodium chloride for salting, use of benzoic acid as a preservative to prevent bacterial build-up, and exploiting the use of fresh water fish for this purpose will limit the amount of nitrosamines in the dried fish.

49-0033
NITROSAMINES

Lijinsky, W.
ACTIVATION OF NITRITE
CONF-750745-2. Oak Ridge Natl. Lab., Tenn. (1975)

At low doses dietary nitrite has no obvious deleterious effect, even when ingested for long periods, and nitrites have been used for a long time as flavoring and coloring additives to meat and fish and as preservatives in food in which there is a danger of botulism. In recent years there has been increasing concern that one form of activation of nitrite might be related to cancer. That is the property of interaction with amino compounds to form N-nitroso compounds, which are potent chemical carcinogens. Results are reported from studies on the carcinogenic effects of nitrite and amines in rats.

49-0034
NITROSAMINES

Davies, D.L., et al
BRIEF COMMUNICATION: AGE-DEPENDENCE OF HEPATIC DIMETHYLNITROSAMINE-DEMETHYLASE ACTIVITY IN THE RAT
J. Nat. Cancer Inst. 56 (5): 1057-7 (1976)

Dimethyl nitrosamine-demethylase, the enzyme affecting the ability of liver microsomes to metabolize DMN, was investigated using groups of rats of comparable age and weight. Animals were observed from 10 days to 110 days. Enzyme activity was most pronounced in the period between weaning and sexual maturity as shown by rat liver tissue analyses, which suggest more susceptibility to the carcinogenic effects of pulse doses of DMN in that age period.

49-0035
NITROSAMINES

Polo, Joel and Chow, Y.I.
EFFICIENT PHOTOLYTIC DEGRADATION OF NITROSAMINES
J. Nat. Cancer Inst. 56 (5): 997-1001 (1976)

N-nitrosodimethylamine (NND) waste solutions containing 10^{-3}M NND in aqueous hydrochloric acid were degraded by photolysis and converted to dimethylamine, N_2 and N_2O in 24 hrs. Two types of apparatus are discussed. The process was catalyzed with guanidine.

49-0036
NITROSAMINES

Fine, D.H. et al
N-NITROSO COMPOUNDS: DETECTION IN AMBIENT AIR
Science 192 (4246): 1328-30 (25 June 1976)

A new technique for detection of N-nitroso compounds in ambient air employs thermal energy analysis. It is uniquely selective, and sensitive to picogram quantities. Studies done by this method were confirmed by GLC and high-performance LC. The technique is based on the catalytic cleavage of the N-NO bond. Several U.S. cities were air sampled, revealing concentrations of 0.02 to 0.96 ppb of dimethylnitrosamine in Baltimore air and concentrations of 0.014 to 0.051 ppb in Belle, W. Virginia air.

49-0037
GENERAL INFORMATION

Keeler, P.A.
LIABILITY IN LABELING (Letter to Editor)
Chem. Week 118 (25): 5 (23 June 1976)

The writer advises that 1,2,3,4-tetrachloro-5,5-dimethoxycyclopentadiene should carry an appropriate poison label because tests at Dow Chemical show it to be highly toxic, causing kidney, liver and lung damage in rats and rabbits. A single oral dose showed the LD50 for rats to be between 12.5 and 25 mg/kg. In rabbits, the LD50 for acute percutaneous absorption was less than 3 mg/kg. As little as 0.1 ml of the chemical instilled into the eye of a rabbit caused the animal to die, even when washed out of the eye after 30 seconds.

49-0038
GENERAL INFORMATION

Anon
CHANGES FORESEEN IN WORLD PRODUCTION OF CHLORALKALIS
Text. Chem. Color. 8 (6): 9-10,12 (1976)

Although 1976 world production of chlorine, caustic soda and soda ash is expected to exceed 80 million metric tons (more than 40% above production 10 years ago), future growth rate predictions are less optimistic. Health hazards of vinyl chloride monomer may restrict the demand for chlorine in PVC, for example. High energy costs and costs of pollution control are already effecting changes in electrolytic cell technology, increasing prices, and forcing some synthetic soda ash plants to close.

49-0039
GENERAL INFORMATION

Anon
BOWING OUT OF SODA ASH
Chem. Week 118 (24): 21 (16 June 1976)

Diamond Shamrock will close down its 64-year-old synthetic soda ash plant in Painesville, Ohio, where annual production of soda ash and related chemicals was 800,000 tons/yr. Earlier, Olin closed its Solvay process unit at Lake Charles, La., and Allied and PPG reduced production, leaving a current estimated annual capacity of 1.97 million tons from Allied, PPG and BASF Wyandotte.

49-0040
GENERAL INFORMATION

Roffman, Haia K. and Roffman, Amiram
WATER THAT COOLS BUT DOES NOT POLLUTE
Chem. Eng. 83 (13): 167-74 (21 June 1976)

Salty or brackish makeup waters may be environmentally safer than recirculated-cooling-water systems that are used to prevent thermal pollution. The salty or brackish systems apparently require fewer additives to prevent corrosion, scaling, and fouling. Chloramines formed from the reaction of chlorine and amines in some of the processes pose a potential hazard to aquatic life.

Shih, Katherine Lu and Lederberg, Joshua
CHLORAMINE MUTAGENESIS IN *BACILLUS SUBTILIS*
Science 192 (4244): 1141-3 (11 June 1976)

Chloramine, a by-product of sanitary chlorination of water supplies, appears to be a weak mutagen, according to tests conducted with *B. subtilis*.

50-0001
ARSENIC

Pinto, S.S. and Nelson, K.W.
ARSENIC TOXICOLOGY AND INDUSTRIAL EXPOSURE
Annu. Rev. Pharmacol. Toxicol. 16: 95-100 (1976)

About 1.5 million people in industrial facilities are exposed to arsenic at least part of the time according to NIOSH estimates. This review of the literature points out that exposed workers most frequently develop malignancies in the lung or on the skin. Carcinogenic activity of arsenic is indicated in all the papers reviewed, although not confirmed by animal experiments. The authors feel that further areas of investigation should be pursued to supplement present knowledge. Smoking habits of the subject; analyses of other air-born contaminants that may be present; and more histological studies on lung cancer are listed as essential. Sufficient data has not been collected on which to base occupational health standards for arsenic. Paper points up difficulties in setting industry standards.

50-0002
ARSENIC

Anon
PROPOSED ARSENIC LIMITS COULD FORCE METAL SMELTERS TO CLOSE
Chem. Week 118 (26): 18 (30 June 1976)

Arthur Younger & Co., consultants in Washington, D.C. have reviewed OSHA proposed limits for worker exposure to inorganic arsenic. According to this study the necessary engineering controls needed to limit direct exposure of some 7,400 workers will be very costly. Asarco's price for controls could amount to $10 million per year. OSHA will hold a hearing on August 24th, to review the economic impact of its proposed 0.004 mg/cu meter limit for worker exposure to arsenic.

50-0003
ARSENIC

Corn, Morton
PROPOSED STANDARD FOR EXPOSURE TO INORGANIC ARSENIC
Fed. Regist. 41 (123): 26029-31 (24 June 1976)

OSHA has prepared the inflation impact statement concerning its proposed standards for arsenic and has scheduled a meeting for the public to include oral testimony and to review new evidence. Documents to be submitted as evidence are listed in this notice. The date of the meeting is August 24, 1976.

50-0004
ARSENIC

Anon
OSHA DELAYS STANDARDS...
Am. Ind. Hyg. Assoc., J. 37 (6): A-6 (1976)

New target dates for safety and health standards have been published, i.e., ammonia (2/77); arsenic (11/76); beryllium (2/77); coke oven emissions (9/76); cotton dust (2/77); lead (3/77); noise (4/77); sulphur dioxide (2/77); toluene (2/77); trichloroethylene (2/77); and ketones (8/76). Need for Economic Impact Statements are considered the cause of the delay. A suit has been filed against OSHA alleging that consideration of inflationary impact is counter to the OSH Act which established protection of the worker's health and its attainment as the only criteria for health and safety standards intended by that law.

50-0005
ASBESTOS

Anon
MEDICAL EXAMS FOR WORKERS EXPOSED TO ASBESTOS...
Am. Ind. Hyg. Assoc., J. 37 (6): A-6 (1976)

The Occupational Safety and Health Review Commission has issued a new ruling which requires yearly medical examinations for employees exposed to any concentration of asbestos. Employers had up to this point interpreted the need for physical examination to be correlated with exposure to the Threshold Limit Value or to a known concentration. This ruling clarifies these ambiguities.

50-0006
ASBESTOS

Anon
DR. WEILL SAYS EVIDENCE SUPPORTS SAFETY OF 2 FIBERS, BUT NOTHING IS CERTAIN
Occup. Health Saf. Lett. 6 (7): 3-4 (8 April 1976)

Reports published by Professor Richard Doll of Oxford Epidemiology Unit in Britain show a reduction in cancer mortality rates from lung cancer in those new to the asbestos industry since regulations were enforced compared to those preceding them. Dr. Hans Weill, Professor of Medicine at Tulane University School of Medicine, and consultant to the Asbestos Information Association/ North America, made studies at a British asbestos textile plant cited by Prof. Doll and stated the preliminary evidence was "encouraging" with respect to the "safety" of a 2-fiber standard for average exposure. Dr. Weill also cited the 1968 British Occupational Hygiene Society's recommendation which resulted in the current British asbestos standard of 2 fibers per ml for chrysotile asbestos. The BOHS subcommittee on asbestos had reviewed the morbidity data provided by Dr. John Knox, Medical director of the British asbestos textile plant.

50-0007
BORON

Dixon, R.L. et al
METHODS TO ASSESS REPRODUCTIVE EFFECTS OF ENVIRONMENTAL CHEMICALS:
STUDIES OF CADMIUM AND BORON ADMINISTERED ORALLY
Environ. Health Perspect. 13: 59-67 (1976)

This study was a cooperative project undertaken with the USSR to assess the effects of boron on male rats and to evaluate the toxic effect on reproduction. Acute oral doses were used for one series of tests 45, 150 and 450 mg/kg. Subchronic studies on rats, utilizing free access to known amounts of boron in the drinking water, were conducted for 90 days. In vivo serial mating and plasma hormone assays were techniques used in this study along with other toxicity tests. The results suggest that boron at the concentrations tested showed no significant toxicity in the reproductive system of rats.

50-0008
BORON

Krosovskii, G.N. et al
TOXIC AND GONADOTROPIC EFFECTS OF CADMIUM AND BORON RELATIVE TO STANDARDS FOR
THESE SUBSTANCES IN DRINKING WATER
Environ. Health Perspect. 13: 69-75 (1976)

This experimental study on boron was conducted in the USSR. The relationship of the general toxic effect to the gonadotropic effect was the focus of the investigation. Random-bred rats which had received oral doses of boron at subacute or chronic levels were submitted to biochemical, physiological, cytological and pathomorphological tests. It was demonstrated that the gonadotropic effect of boron was dominant over the general toxic effects (6 mg/kg vs. 20 mg/kg). The recommended standard for boron in drinking water based on this study is 0.5 mg/l.

See: 50-0011, Flame Retardents

Anon
FLUOROCARBONS VS. OZONE ISSUE RAGES ON
Chem. Eng. News 54 (28): 7 (July 1976)

At a recent National Bureau of Standards conference on ozone depletion by fluorocarbons, different views expressed by participants leave many questions unresolved. A staff member from NOAA in discussing the chlorine-nitrate reaction in the atmosphere stated that based on a photochemical computer model it appears that this reaction could reduce ozone depletion by about 50%. A representative from Du Pont stated that measurements being taken by them indicate that the lifetime for fluorocarbons in the atmosphere is less than 20 years. The University of California team who proposed the ozone depletion theory now state that the danger may be more severe than originally outlined.

Weiss, William
CHLOROMETHYL ETHERS, CIGARETTES, COUGH AND CANCER
J. Occup. Med. 18 (3): 194-9 (1976)

In this study the term chloromethyl methyl ether (CMME) represents this chemical and bis(chloromethyl) ether BCME. A group of 125 male production workers in a chemical plant, who had been exposed to the chemicals, was studied for 5 years at intervals averaging 8.5 months. There was an additional follow-up period of 5 years. Clinical tests were accompanied by questionnaires which took into account age, smoking habits, exposure to the chemicals and respiratory symptoms. Chronic cough and expectoration showed a dose-response relationship to chemical exposure and was more prevalent in those exposed. The 10 year incidence of lung cancer followed the same pattern. However the disease was inversely related to cigarette smoking.

Sundström, G. and Hutzinger, O.
ENVIRONMENTAL CHEMISTRY OF FLAME RETARDANTS V. THE COMPOSITION OF Bromkal^{R} 70-5 DE - A PENTABROMODIPHENYL ETHER PREPARATION
Chemosphere 5 (3): 187-90 (1976)

This flame retardant composition manufactured by Chemische Fabrik Kalk GmbH is similar in structure to compounds known to affect the environment e.g. polychlorinated and polybrominated biphenyls. Gas chromatography analyses and NMR spectra of Bromkal are presented and discussed.

Mirvish, Sidney S. et al
AIR-WATER AND ETHER-WATER DISTRIBUTION OF N-NITROSO COMPOUNDS: IMPLICATIONS FOR LABORATORY SAFETY, ANALYTIC METHODOLOGY, AND CARCINOGENICITY FOR THE RAT ESOPHAGUS, NOSE, AND LIVER.
J. Nat. Cancer Inst. 56 (6): 1125-9 (1976)

Twenty-one N-nitroso compounds were studied for volatility by measuring the air-water and ether-water distribution ratio and the solubility in water. Using information from the literature on specific tumor incidence in rats, the authors correlated solubility with hazard to animals treated with these compounds. Distribution ratios were reviewed in the same way. The high air-water distribution ratio or some NNO compounds indicate that laboratory workers should be extremely careful in handling solutions of these compounds or in handling animals treated with them.

Fiala, Emerich S. et al
DETECTION AND ESTIMATION OF AZOMETHANE IN EXPIRED AIR OF 1,2-DIMETHYLHYDRAZINE-TREATED RATS
J. Nat. Cancer Inst. 56 (6): 1271-2 (1976)

Although the carcinogenic properties of azomethane have not been studied the authors believe that this compound would behave like 1,2-dimethylhydrazine as a carcinogen. Rats treated with DMH were kept in a controlled atmosphere and the air leaving the chamber was collected in gas bottles and analyzed. The azomethane in this respired air was analyzed by mass spectrometry and chromatography. Most of the compound was found in the first 6 hours after injection of DMH. These results indicate that test animals under study for this compound should be kept in a well ventilated area to avoid exposure to azomethane gas that is expired by the animals.

50-0014
HYDRAZINE

Kimball, R.F. and Hirsch, B.F.
FIXATION AND LOSS OF HYDRAZINE-INDUCED PREMUTATIONAL DAMAGE IN *HAEMOPHILUS INFLUENZAE*
Mutat. Res. 36: 39-48 (1976)

The premutational lesions produced by hydrazine in *Haemophilus Influenzae* can be lost prior to replication by an unknown process. These lesions must be converted to some form before they can pass through transformation to yield mutations and the conversion occurs exclusively at replication. The lesions are not single-strand breaks or alkali-labile sites.

Kimball, R.F.
REVERSIONS OF TWO PROLINE-REQUIRING AUXOTROPHS OF *HAEMOPHILUS INFLUENZAE* BY N-METHYL-N'-NITRO-N-NITROSOGUANIDINE AND HYDRAZINE
Mutat. Res. 36: 29-38 (1976)

Two new auxotrophic systems for mutation detection for *Haemophilus Influenzae* are described. These systems involve reversions at two different sites in a proline locus and forward mutations to unlinked suppressors for one of the sites. Comparative studies between the various mutation detection systems are also discussed.

50-0016
LIQUEFACTION AND GASIFICATION OF COAL

Zahradnik, Raymond L.
COAL CONVERSION R & D: WHAT THE GOVERNMENT IS DOING
Chem. Eng. Prog. 72 (6): 25-32 (1976)

A brief review of the Government's activities in coal conversion and utilization is given including the aims of the work underway in the Fossil Energy Program of the Energy and Development Administration (ERDA). Liquefaction of coal is cited for its economic advantages, its environmental acceptibility, and its potential in reliable commercial operations. Major coal liquefaction, high B.t.u. gasification, low B.t.u. gasification, and direct combustion projects are outlined together with the status of the Demonstration Plant Program. The more than 100 contracts currently outstanding total over $400 million with industry supplying more than $100 million of that amount.

50-0017
LIQUEFACTION AND GASIFICATION OF COAL

Anon
ADL DEVELOPS COAL LIQUEFACTION PROCESS
Chem. Eng. News 51 (28): 30 (5 July 1976)

ERDA is funding ADL's new process for coal liquefaction. Extractive coking is a key feature of this method. A mildly hydrogenated aromatic solvent is mixed with crushed coal and kept at about 100 psi. Hot solvent is passed continuously through the coking drum. This step is followed by cracking and coking to separate the product as a vapor from coal and ash. The process is still at pilot plant stage. However, it has a number of advantages over existing ones, e.g. extraction takes place at much lower pressure thus eliminating the need for much high pressure equipment.

Anon
COMBINED-CYCLE COAL-CONVERSION PLANT WINS FUNDING
Chem. Eng. 83 (14): 39 (5 July 1976)

The state of Illinois, the Electric Power Research Institute, and two U.S. corporations are sharing in the expenditures for a huge coal-conversion plant at a Commonwealth Edison Co. electric power generating plant in Illinois. Total cost is $104.9 million of which $62.2 million has Congressional approval for funding through ERDA. The Power Company will spend $20 million. The project will use Lurgi technology to convert high-sulfur coal into gas which will power a 25MW gas turbine generator.

Nomura, T.
COMPARISON OF TUMOUR SUSCEPTIBILITY AMONG VARIOUS ORGANS OF FOETAL, YOUNG AND ADULT ICR/Jcl MICE
Br. J. Cancer 33 (5): 521-34 (1976)

This study of cell sensitivity of various organs to carcinogenic action was carried out on mice using, foetal, young and adult ages. Urethane-carbonyl-^{14}C was employed since this compound will distribute in the major organs. Tumor susceptibility was significantly higher for young and adult mice than for those of foetal age. Male foetuses and neonates were the only group affected by hepatomata. Tumors in female reproductive organs were also very prevalent.

50-0020
TRICHLOROETHYLENE

Anon
DOW RAISES PRICES OF CHLORINATED SOLVENTS
Chem. Week 118 (24): 27 (16 June 1976)

Effective July 1, 1976, several chlorinated solvents will increase 5% in price. Methylene chloride and trichloroethylene will increase their price 1¢ to 19.75¢/lb. in bulk and 23.74¢/lb. in full loads of drums. Dow's 1,1,1-trichloroethane is expected to jump to $2.80/gal. in full loads of drums and $2.38/gal. in bulk. Dowclene's new price is to be $2.85/gal. in drums and $2.41/gal. in bulk.

50-0021
TRICHLOROETHYLENE

Anon
NCI REPORTS TCE CAUSES CANCER IN MICE, WARNS AGAINST HASTY SUBSTITUTIONS
Toxic Materials News 3 (13): 100 (23 June 1976)

Based on their bioassay of trichloroethylene (TCE), which showed TCE induced hepatocellular carcinoma in mice, the National Cancer Institute (NCI) concluded that TCE is a carcinogen to mice. Cancers of the liver developed in 31 of 48 (64.5%) male mice given high doses of TCE by stomach tube and hepatocellular carcinoma developed in 26 of 50 (52%) male mice given low doses. Liver cancer developed in 11 of 47 (23%) female mice given high doses of TCE and in 8% given low doses. One hepatocellular carcinoma was found in 80 female control mice. NCI warns of possible TCE carcinogenicity in humans and cautions regarding the use of substitutes for TCE which also need to be investigated for their impact on human health.

See: 50-0004, Arsenic

Anon
ERDA TAGS $25 MILLION FOR SHALE OIL RESEARCH
Chem. Week 119 (1): 32 (7 July 1976)

Research on technology for in situ shale oil recovery is being funded by ERDA. Occidental Oil Shale (Calif.) and three other companies will participate in the program with a proposed research budget of $21-million.

Anon
DER STAFF AIDS AT TRAIN WRECK
Pennsylvania Econotes Dept. Environ. Resources 4 (9): 5 (June 1976)

A vent pipe leak from the top of a tank car lying on its side and containing 11,000 gallons of ethylene dibromide resulted from a train wreck near Spruce Creek Pennsylvania on May 16. By carefully righting the tank car, the leaked was stopped and a potential hazard avoided. There was no further danger to clean-up crews.

50-0024
GENERAL INFORMATION

Anon
CARCINOGENIC POTENTIAL OF DMCC
Am. Ind. Hyg. Assoc., J. 37 (6): 370-1 (1976)

Acute toxic effects and carcinogenic potential of dimethylcarbamoyl chloride (DMCC) were reported by Dr. Norton Nelson, Professor and chairman of the Institute of Environmental Medicine at N.Y. University Medical Center, after observing irritation to eye membranes and respiratory organs and inflammation of the skin of laboratory animals upon repeated contact. Van Duuren at the same Institute reported that squamous cell carcinomas appeared within 200 days in the noses of 89 out of 93 rats exposed to 1 ppm DMCC by inhalation. About 3000 lbs of DMCC were manufactured domestically about a year ago for use in the synthesis of pharmaceuticals used to treat myasthenia gravis and as a reagent for the synthesis of carbamates in chemical research laboratories. With the limited production and use of DMCC in the U.S., fewer than 200 persons are occupationally exposed to DMCC and the majority of these exposures occur intermittently in the chemical laboratories but the high incidence of nasal cancer and short latency period in rats was emphasized.

50-0025
GENERAL INFORMATION

Anon
CARCINOGENESIS BIOASSAY OF CHLOROFORM
Fed. Regist. 41 (113): 23449 (10 June 1976)

Results of a carcinogenesis bioassay of USP grade chloroform using rats and mice are summarized. A report by the Division of Cancer Cause and Prevention of NCI covers the study of 50 animals of each sex at two dose levels five times per week for 78 weeks. All groups treated showed a decrease in survival rate and weight gain. Kidney epithelial tumors were observed in male rats with incidences of 0% in controls, 8% in the low dose and 24% in the high dose groups. Hepatocellular carcinoma were observed in both sexes of mice with incidences of 98% for males and 95% for females at the high dose, 36% for males and 80% for females at the low dose, compared to 6% in both matched and colony control males, 0% in matched control females and 1% in colony control females. Although they had not developed hepatocellular carcinoma, many low dose male mice showed nodular hyperplasia of the liver.

50-0026
GENERAL INFORMATION

Anon
SHELL CHECKS FOR CANCER
Chem. Week 118 (26): 23 (30 June 1976)

Shell Oil is undertaking medical epidemiologic studies to determine whether cancer incidence among present and former workers employed in the lubricant dewaxing and isopropanol units at Deer Park exceeds the rate for the area's general population. During the 1958 to 1976 period, eight cases of cancer, including five deaths, were reported among workers in the dewaxing unit and six cases of cancer, including three deaths were reported among employees in the isopropanol unit. There is no evidence on the relationship between the incidence of cancer and the workplace.

50-0027
GENERAL INFORMATION

Anon
TOXICITY OVERLOOKED
Chem. Eng. News 54 (27): 3 (28 June 1976)

This letter writer notes that the 1968 edition of the Merck Index classifies sym-tetrachloroethane as most toxic of all common chlorinated hydrocarbons. He indicates that the practice of using this chemical as a bath liquid for fluoride distillation method is due to its nonflammability and overlooks the toxicity.

50-0028
GENERAL INFORMATION

Anon
TOTAL OF 20 KEPONE WORKERS SIGNIFICANTLY DISABLED, MEDICAL OFFICIAL REPORTS
Toxic Materials News 3 (13): 104 (23 June 1976)

Kepone, an ingredient used in pesticide manufacture, has been found carcinogenic in animals. NIOSH has recommended a maximum exposure limit of one microgram per cubic meter of air for up to 10 hours per day, 40 hours per week, over a working lifetime. A status report from a state epidemiologist in Virginia cites figures on worker disability. Twenty former employees of a pesticide company have a significant disability and 12 will probably never be able to work. Twenty-eight workers have been treated for neurological symptoms. No evidence on carcinogens activity in humans was noted in this article.

50-0029
GENERAL INFORMATION

Anon
EYE INJURY POTENTIAL
Chem. Eng. News 54 (27): 3 (28 June 1976)

Dr. Raymond W. Morrow, Chief of the Dermal & Ocular Toxicology Section Haskell Laboratory at Du Pont reported to NIOSH that the seed protectant fungicide, 1,2-bis(ethylsulfonyl)-1,2-dichloroethylene, produced severe, penetrating, irreversible corneal injury to the rabbit eye. Although lessened, the effects were not prevented by prompt washing with water. Caution against severe eye injury is also noted for other applications of this chemical, e.g., its use as a synthetic intermediate because both chlorines are readily displaced by nucleophilic groups.

Kirkland, D.J. and Venitt, S.
CYTOTOXICITY OF HAIR COLOURANT CONSTITUENTS: CHROMOSOME DAMAGE INDUCED BY TWO NITROPHENYLENEDIAMINES IN CULTURED CHINESE HAMSTER CELLS
Mutat. Res. 40: 47-56 (1976)

Nitrophenylenediamines (2-nitro-p-phenylenediamine (2NPPD) and 4-nitro-o-phenylenediamine (4NOPD)), used as constituent dyes in many proprietary hair colourants, have been associated with a long-term health hazard--potent mutagens in bacteria and carcinogenic in mice. The cytotoxic effects of these compounds to eukaryotic cells were examined by the authors using chinese hamster cells. Both compounds were cytotoxic to CHMP/E cells after 5 days continuous exposure with 2NPPD more toxic than 4NOPD at equivalent doses. Time-dependent increase in the incidence of chromosome aberrations after exposure to 25 μg/ml dosage was especially marked after four and seven days exposure with 2NPPD causing more chromosome damage than 4NOPD at equivalent doses. The authors indicate that hair dressers/beauticians and cosmetic manufacturers may have increased risk of cancer due to their exposure to these chemicals.

51-0001
ASBESTOS

Becklake, M.R.
STATE OF THE ART--ASBESTOS-RELATED DISEASES OF THE LUNG AND OTHER ORGANS:
THEIR EPIDEMIOLOGY AND IMPLICATIONS FOR CLINICAL PRACTICE
Am. Rev. Respir. Dis. 114: 187-22 (1976)

This review of the literature on the health hazards of asbestos has been prepared with the clinical physician in mind since most published studies have been prepared by epidemiologists. It discusses the occupations at risk in mining, milling and manufacture and the incidence of indirect exposure e.g. from the environment. The fate and biological effects of inhaled asbestos fibers are presented in detail with information on uncoated asbestos particles in the lung and coated fibers, where the asbestos has undergone a physiological change in the lung. Information on pleural plaques and pleural effusion is included. Detailed review of the asbestosis literature and review of published papers on carcinomas resulting from asbestos are presented with a discussion of the clinical implications of the epidemiological findings.

51-0002
ASBESTOS

Anon
EPA FINDS ASBESTOS IN DRINKING WATER OF FIVE CITIES
Toxic Materials News 3 (10): 76 (15 May 1976)

Assistance will be provided by EPA to help cities improve on techniques employed at water treatment plants. More efficient ways to remove asbestos fibers from drinking water will be investigated under this plan. Animal feeding studies as well as epidemiological studies will be conducted by the Dept. of Health, Education, and Welfare along with EPA to determine the effects of asbestos in drinking water. Better analytical methods are needed. State and local officials will work with the agency to identify and remove man-made discharges of the fibers. Boston, Philadelphia, Atlanta, San Francisco, and Seattle showed asbestos in their drinking water. New York, Chicago, Dallas, Kansas City, and Denver water samples evidenced no asbestos.

51-0003
ASBESTOS

Beddows, N.A.
FIBROUS ASBESTOS: ITS USE IN THE CONVERTER INDUSTRIES
Adhesives Age 19 (6): 42-4 (1976)

The converter industries utilize asbestos in conjunction with organic resins and thermoset matrices in the manufacture of asbestos board, surface coatings, cements etc. New methods of handling such as wet processing are being evaluated by the industry. In view of OSHA's standards, which is expected to become law this year, the industry will have to provide for policing and monetoring of worker exposure. Asbestos usage will have to be trimmed in those areas where it will not be profitable to produce converter products.

51-0004
ASBESTOS

Anon
EXPOSURE TO ASBESTOS DUST
Br. Med. J. 1 (6022): 1361-2 (5 June 1976)

Blue asbestos, the crocidolite type, has been used to insulate and fire-proof buildings in Britain prior to 1969. It is now strictly controlled since it became implicated in the development of mesotheliomas. Alterations or demolition of buildings containing this material are regulated by the Health Safety Executive. The Advisory Committee on Asbestos Cancers examined general population exposure in urban areas to review the effects of the crocidolite type of asbestos compared to the chrysotile type. There was no evidence of excess risk from air pollution for people in the neighborhood of the chrysotile mines. However, there was evidence of an association of mesothelial cancers from air pollution in the population near the crocidolite mines and factories. Differences were reported when incidences of cancers were studied from the point of view of urban vs. rural areas. Further studies are being conducted in Britain in an attempt to establish the actual amount and type of mineral dust of all cases of mesotheliomas occuring over a one year period.

Anon
WALL-REPAIR GOODS ARE SAID TO CONTAIN CARCINOGENIC FIBERS
Wall Street Journal p.30 (16 July 1976)

The Consumer Product Safety Commission has been petitioned recently by two public interest organizations concerned with banning asbestos materials in wall-repair compounds. Medical studies were cited which showed very high concentrations of asbestos fibers in the air after use of some of these compounds. The petitioners are the Consumers Union and the Natural Resources Defense Council.

51-0006
FLUOROCARBONS

Hudson, Jim
AIRBORNE RESEARCH SHOWS ZERO DAMAGE TO OZONE LAYER BY AEROSOLS
Aerosol Age 21 (6): 22-4 (1976)

A unique research project on fluorocarbons and their damage to the ozone layer is being conducted by Washington State University. The research is funded principally by the Manufacturing Chemists Association. Specialized equipment has been fitted into a Learjet 24D plane. Large numbers of air samples collected and analyzed by gas chromatography for fluorocarbons. The measurements are carried out while in flight. The air samples, sealed in pressurized containers are returned to a Washington State University laboratory for further analysis. These data are checked against the analyses made while in the air. Dr. R.A. Rasmussen, head of this project, states that ozone depletion in the atmosphere, which would result from the use of fluorocarbons by man, is minimal -- only a fraction of a percentile.

51-0007
FLUOROCARBONS

Donovan, R.J. et al
REACTIONS OF $O(2^1D_2)$ WITH CHLOROFLUOROMETHANES AND CCl_4
Nature 262: 204-5 (15 July 1976)

A laboratory based study using flash photolysis and a nozzle beam mass spectrometer sampling system was undertaken to analyze primary and secondary processes which take place as a result of the photochemically initiated reaction between ozone and Freons 11-13 ($CFCl_3$, CF_2Cl_2 and CF_3Cl). The mechanism and kinetics of these reactions indicate significantly increased ozone depletion from secondary reactions according to this research. Using Freon 11-13 (ozone ratios around 5) the increase was by a factor of 3-5. The findings support previously documented observations which employed U.V. absorption spectroscopy.

51-0008
FLUOROCARBONS

SanGiovanni, M.L.
EXONERATING FLUOROCARBONS: NEW EVIDENCE OR HEARSAY?
Aerosol Age 21 (6): 25-8 (1976)

The Fluorocarbon Industry has provided a budget of approximately $2.5 million to continue research on atmospheric ozone at current levels through 1977. Funded programs include direct multiple experimental flights using an airborne laboratory. These flights will be coordinated with the French Government's Agency ONERA which fly similar missions over the south of France. Investigation of the chemical processes of ozone depletion will be undertaken by several Universities and the National Center for Atmospheric Research. Atmospheric modeling and U.V. monitoring at ground level are additional sponsored programs. Seventeen scientists employed in these projects and their affiliations are listed.

51-0009
FLUOROCARBONS

Cox, P.J. et al
THE BINDING OF TRICHLOROFLUOROMETHANE AND OTHER HALOALKANES TO CYTOCHROME P-450 UNDER AEROBIC AND ANAEROBIC CONDITIONS
Xenobiotica 6 (6): 363-75 (1976)

Animal studies on trichlorofluoromethane indicate that this compound will react with hepatic microsomal cytochrome P-450. Male Wistar rats, mice, hamsters and guinea pigs were treated with CCl_3F by stomach tube. As soon as the animals were sacrificed the livers were rapidly removed and microsomal fractions prepared and analyzed by Spectrophotometry. A number of animals were pre-treated with drugs to study possible effects of CCl_3F on drug metabolism. Test procedures were the same for these animals. Results are reviewed in detail. It is postulated that trichlorofluoroethans ligands with the Fe^{2+} of the haem of reduced cytochrome P-450 to produce a complex.

Walton, B. et al
UNEXPLAINED HEPATITIS FOLLOWING HALOTHANE
Br. Med. J. 1: 1171-6 (1976)

Multiple exposure to halothane as a result of short surgical procedures seems to be a source of jaundice which has been seen in a large number of post-operative patients. Full clinical and laboratory data from 203 patients were reviewed by a panel of hepatologists. Sixty-seven of these had no explanation for onset of the disease. The mean latent period between time of anaesthesia and onset was 6.6 days with jaundice appearing after one week post-operative in a majority of cases. Clinical data are presented on body temperature, and immunological findings as well as information as to age, sex, obesity and death rate. The authors conclude that even with considerable questions in the data it is reasonable to suggest that halothane can cause unexplained hepatitis in some patients.

51-0011
HALOETHERS

Lansdown, A.B.G. et al
ANALYSIS OF FETAL DEVELOPMENT IN RATS FOLLOWING MATERNAL EXPOSURE TO SUBANESTHETIC CONCENTRATIONS OF HALOTHANE
Teratology 13: 299-304 (June 1976)

Halothane did not produce fetal deaths or teratogenic effects in pregnant rats exposed to low levels during the period of high organogenesis and rapid growth (days 8-12 of gestation). Series tests on Sprague-Dawley rats were conducted at 50, 100, 200, 800, 1600 and 3200 ppm. Fetal growth was retarded however, when exposure began at day one of pregnancy and lasted through day 21, at levels of 1600 ppm although there was no evidence of fetal loss. The authors compare these data with those of other researchers.

Elder, G.H. et al
THE EFFECT OF PORPHYROGENIC COMPOUND, HEXACHLOROBENZENE, ON THE ACTIVITY OF HEPATIC UROPORPHYRINOGEN DECARBOXYLASE IN THE RAT
Clin. Sci. Mol. Med. 51 (1): 71-80 (1976)

After at least four weeks, female Wistar rats fed a diet containing 0.3% hexachlorobenzene (HCB) developed porphyria as indicated by an increase in urinary porphyrin excretion. As porphyria developed and after eleven weeks, a decrease in the activity of uroporphyrinogen decarboxylase activity in the liver of the rats progressed to reach 18% of the control values. No accumulation of iron in the liver was noted. The substrate 5-carboxyl porphyrinogen was used in the measurement of uroporphyrinogen decarboxylase in the rat liver homogenates. The authors indicate that HCB or a metabolite acts to decrease the activity of this enzyme resulting in the porphyria and suggest that identical porphyrias produced by other polychlorinated hydrocarbons may be the result of the uroporphyrinogen decarboxylase defect.

Laseter, John L. et al
AN ECOLOGICAL STUDY OF HEXACHLOROBUTADIENE (HCBD)
New Orleans University, La. Dept. of Biological Sciences (April 9, 1976) 71p.
EPA/560/6-76/010 PB-252 671/3WJ PC$4.50/MF$2.25

Hexachlorobutadiene (HCBD) has been found in the environment in southeastern Louisiana in addition to other parts of the world. In this region it is a byproduct of the petrochemical industry. HCBD has been used as an insecticide in central European orchards and vineyards where excessive contact has caused illness in humans. In this study, soil, water and organism samples were collected periodically in 1974 and 1975 from sites in southeastern Louisiana, with emphasis along the Mississippi River and an industrial region of known contamination of HCBD near Geismar, Louisiana. Maximum HCBD concentrations in water from the two areas were 1.9 and 4.7 microgram/l (ppb). Maximum HCBD concentrations in soil from the two areas were 790 and 1,080 microgram/Kg (ppb). Laboratory experiments with the compound included acute toxicity studies in aquatic systems and through injection in fish and crayfish. Accumulation and depuration rates were determined and observations made with histological slides of tissue.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.480 (19 July 1976)]

Wesbroth, S.H. et al
ACCESSORY SPLEENS IN DOMESTIC RABBITS (ORYCTOLAGUS CUNICULUS) II. INCREASED FREQUENCY IN HEMATOLOGICAL DISEASES AND EXPERIMENTAL INDUCTION WITH PHENYLHYDRAZINE
Teratology 13: 253-62 (June 1976)

Because of its known effects on hematopoietic tissue and spleen, phenylhydrazine hydrochloride was injected into 80 rabbits inbred from common ancestry with a high frequency of hereditary autoimmune hemolytic anemia or lymphosarcoma with the intent of inducing accessory spleens for the study of hematological disease. Accessory spleens appeared in 45% of the treated rabbits, an increase in frequency compared to about 9% background frequency in randombred rabbits. Induced accessory spleens were generally slightly larger (2-5 mm in diameter) than those occurring naturally (1-3 mm). The authors discuss their hypothesis and their experience with several findings reported by others in the literature.

Fu, Y.C. and Illig, E.G.
CATALYTIC COAL LIQUEFACTION USING SYNTHESIS GAS
Ind. Eng. Chem. Process Des. Dev. 15 (3): 392-6 (1976)

A process for coal liquefaction has been developed which utilizes synthesis gas ($1H_2$:1CO) and eliminates the use of pure hydrogen which is costly. Coal is treated with the gas at 3000 psi and 425-450°C in the presence of cobalt-molybdate and sodium carbonate catalysts, steam, and an alkylnaphthalene oil. In the process the coal is desulfurized effectively. The synthesis gas can be obtained from the gasification of the char produced and the off-gas after treatment is a low Btu gas suitable for methane production or methanol synthesis.

51-0016
LIQUEFACTION AND GASIFICATION OF COAL

Anon
LUMMUS NAMED OPERATOR OF SYNTHANE COAL-GAS PILOT PLANT
Coal Age 81 (6): 37 (1976)

A newly constructed pilot plant for coal gasification will test the technical and economic feasibility of the Synthane process. The project, funded by the Energy Research and Development Administration, will cover a two year period. The plant cost $15 million and will be operated by C.E. Lummus & Co. with ERDA supplying $26.7 million. It is designed to convert 72 tpd of coal into 1.2 million cu.ft. of pipeline quality gas in an environmentally acceptable manner.

51-0017
POLYURETHANES

Anon
POLYURETHANES
Chem. Eng. News 54 (29): 12 (12 July 1976)

By late 1977 Thiokol will have a $5 million plant in operation to produce specialty polyurethanes, plasticizers, and oligomers at the Moss Point, Mississippi facility.

51-0018
POLYURETHANES

Anon
A PROGRAM EMPHASIZING URETHANE FOAM TECHNOLOGY
Chem. Eng. News 54 (29): 17 (12 July 1976)

Ten urethane producers and processors are funding a $200,000 annual budget for graduate study in urethane foam technology. Four students were in the program this year which included laboratory research, literature searches, and a course in polyurethane processing. Sponsors hope to double the funding. Present levels could support 10 graduate students

51-0019
TRICHLOROETHYLENE

Anon
FDA IS DRAFTING AN ORDER TO BAN TRICHLOROETHYLENE
Chem. Eng. News 54 (29): 7 (12 June 1976)

Some ground coffees and instant coffees are treated with TCE in the decaffeinating process. This solvent has been studied by the National Cancer Institute and it was found to produce liver cancer in mice. On the basis of these studies the Food and Drug administration is drafting an order to ban the use of this chemical on coffee.

51-0020
TRICHLOROETHYLENE

Anon
DIAMOND ADDING TO TRICHLOROETHYLENE CAPACITY
Chem. Week 119 (3): 20 (21 July 1976)

Diamond Shamrock has added to its capacity for trichloroethylene manufacture at the Deer Park, Texas, installation. This is the result of process improvements. An erroneous report has been corrected since the company states that it is not planning to end the sale of this chemical to any market--the degreasing market will be serviced.

Anon
GO SLOW ON CHEMICAL SUBSTITUTES FOR CARCINOGENS, NCI REPORT WARNS
Environ. Health Lett. 15 (2): 6 (1976)

The National Cancer Institute has stated that methylene chloride has not been tested for its carcinogenic potential. Therefore this compound should not be used as a substitute for trichloroethylene in the preparation of decaffeinated coffee. It could mean that the replacement chemical, methylene chloride, was the more hazardous substance.

51-0022
VINYL CHLORIDE

Going, John E.
SAMPLING AND ANALYSIS OF SELECTED TOXIC SUBSTANCES. TASK III. VINYL CHLORIDE, SECONDARY SOURCES
Midwest Research Institute, Kansas City, Mo. (April 1976) 30p. EPA/560/6-76/002
PB-252 966/7WJ PC$4.00/MF$2.25

A sampling and analysis program was conducted to determine whether and to what extent vinyl chloride was present in ambient air due to the presence of polyvinyl chloride products. Sampling environments were chosen to represent real life, but nonwork situations where a significant exposure to polyvinyl chloride products might occur. A sampling and analysis protocol was developed with a recovery efficiency of greater than 90% and a detection limit of 10ppb (v/v). The two general categories of environments sampled were vehicles and commercial products. The interior ambient air was sampled from new and used domestic automobiles, foreign automobiles and domestic mobile homes. No evidence of vinyl chloride was found. The following commercial vinyl products, when sampled in their normal environment, did not produce a measurable quantity of vinyl chloride in the ambient air; vinyl wall covering; vinyl swimming pool liners; and vinyl nursery products. A room being painted with a heavily pigmented red paint was found to contain a very low level of vinyl chloride.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, pp.489-90 (July 19, 1976)]

51-0023
VINYL CHLORIDE

Anon
VINYL CHLORIDE PROBLEM IN WASHINGTON STATE SAID TO BE MINIMAL
Occup. Health Saf. Lett. 6 (13): 6 (8 July 1976)

The University of Washington's Department of Environmental Health surveyed vinyl chloride exposure at 13 plants throughout the state. Total exposed worker population was reported to be no more than 500 with the transfer of raw material from rail car cited as "a most critical operation" and one requiring "adequate respiratory function and protective garments." The state's Department of Labor and Industries' Division of Safety and Health requested the study and as of June 6, 1975 adopted a vinyl chloride standard. The standard limits the permissible exposure to 1 ppm based on an eight-hour time-weighted average with a maximum of 5 ppm averaged over 15 minutes. No direct contact with liquid vinyl chloride is permitted with the action level established at 0.5 ppm averaged over an eight-hour work day.

Bolt, H.M. et al
DISPOSITION OF [1,2-^{14}C] VINYL CHLORIDE IN THE RAT
Arch. Toxicol. 35 (3): 153-62 (1976)

The fate of vinyl chloride in vivo and the inhibition of its uptake by specific and potent inhibitors of cytochrome-P-450-dependent mixed function oxidations were examined. Male rats exposed to ^{14}C vinyl chloride at initial concentrations below 100 ppm in a closed system showed no relationship between changes in oxygen uptake from the spirometer and changes in vinyl chloride uptake. Acute pretreatment with 35 mg/kg 3-bromophenyl-4(5)-imidazole or 50 mg/kg 6-nitro-1,2,3-benzothiadiazole in 0.6 ml/kg DMSO completely blocked vinyl chloride uptake. Doses of 50 mg/kg SKF 525 A or 5,6-dimethyl-1,2,3-benzothiadiazole in 0.6 ml/kg resulted in weaker inhibition. Doses of 50 mg/kg pyrazole produced comparatively weak inhibition while 100 mg/kg in DMSO of pyrazole completely blocked vinyl chloride uptake. Metyrapone did not inhibit vinyl chloride uptake. On the other hand, pretreatment with DDT increased vinyl chloride uptake and, to a lesser degree, clotrimazol did, too. Pretreatment with phenobarbital 3-methylcholanthrene, rifampicin or chronic ethanol treatment produced no significant increase in uptake. Radioactive metabolites of ^{14}C-vinyl chloride were excreted 69.4% (± 2.6%) within 24 hours in the urine. The highest radioactivity levels appeared in the liver and kidney immediately following exposure.

51-0025
NITROSAMINES

Sen, N.P. et al
DIMETHYLNITROSAMINE AND NITROSOPYRROLIDINE IN FUMES PRODUCED DURING THE FRYING OF BACON
Food Cosmet. Toxicol. 14: 167-70 (1976)

Bacon samples fried for 13 minutes in an electric frying pan at a temperature of 345-350°F were used in this study. Fumes from the frying were collected in three different types of trapping liquids. GLC-high resolution mass spectrometry analyses show that 70% of the dimethylnitrosamine and 50% of nitrospyrrolidine produced during cooking are volatitized in the fumes. Samples of bacon treated with ascorbyl palmitate just before cooking, significantly reduces the nitrosopyrrolidine in the cooked product. The concentration of DMN in cooked bacon is normally very low (1-5 ppb) therefore it was not possible in these experiments to assess the effect of ascorbyl palmitate on this compound. These tests suggest further work of the effectivness of ascorbyl palmitate.

51-0026
NITROSAMINES

Egert, G. and Greim, H.
FORMATION OF DIMETHYLNITROSAMINE FROM PESTICIDES CARRYING METHYLATED TERTIARY AMINOGROUPS IN THE PRESENCE OF NITRITE AT pH 3
Food Cosmet. Toxicol. 14: 193-5 (1976)

Amines with a potential for forming nitroso compounds may be ingested in the form of pesticide residues left on human food. Four tertiary amine pesticides were reacted with sodium nitrite and the reaction products extracted by dichloromethane. Dimethylnitrosamine was determined by infra-red spectraphotometry, gas chromatography-mass spectrometry, NMR spectrometry and light photometry. All four pesticides form dimethylnitrosamines, cycluron 4%, chloroxuron 3%, thiuram 9% and dimefox 22%.

Anon
DIETARY NITROSAMINES
Food Cosmet. Toxicol. 14: 205-6 (1976)

This review of the literature covers papers published from 1970 through 1974. Thirteen papers relate to nitrosamines in human foods--fresh and canned meat, fish, sausage meats, and bacon. One paper relates the harm done to mink through nitrosamines in their fish meal feed. A paper notes excess nitrate in calf feed resulting in nitrosamines in the carcass meat. A cited paper states that rats developed tumors when fed wheat from a soil treated with a high dose of nitrate fertilizer. Two papers discuss high nitrate content of tobacco.

51-0028
GENERAL INFORMATION

Anon
THE ACUTE AND CHRONIC BIOCHEMICAL AND BEHAVIORAL EFFECTS OF CYCLOTRIMETHYLENETRINITRAMINE
Maryland University Baltimore School of Pharmacy (March 31, 1975) 37p.
AD-A024 415/2WJ PC$4.00/MF$2.25

Ther overall objective of this project was to determine if trimethylenetrinitramine, a central excitatory agent, induces changes in behavior, in brain metabolism and in neurotransmitters. This objective was approached through a comparison of doses and time relationships between changes in biochemical parameters and changes in behavioral measures of brain activity. This report presents the results of studies designed to (1) Establish the effect of trimethylenetrinitramine on oxygen uptake and determine the effect on two specific brain enzyme systems, brain cholinesterase and monoamine oxidase. (2) Establish the effect of trimethylenetrinitramine on steady state levels and turnover rates of brain norepinephrine, dopamine, 5-hydroxytryptamine and possible gama-aminobutyric acid (GABA).

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology p.471 (12 July 1976)]

51-0029
GENERAL INFORMATION

Anon
INDUSTRY SHELLS OUT FOR SELF-SURVEILLANCE
Chem. Week 119 (3): 13-14 (21 July 1976)

All of the major chemical companies have had facilities for testing their products for possible toxic effects for many years. Dow has had a toxicology laboratory since 1933, du Pont has been testing products for more than 40 years. However, both companies have expanded their facilities--Dow recently spent $3.9 million on its toxicological laboratory and du Ponts' Haskell Laboratory for Toxicology and Industrial Medicine is finalizing a 70% expansion program. Allied Chemical, GAF Corp., Monsanto, Stauffer, and Union Carbide are stepping up their toxicological test programs. Hercules Chemical Co. feels its testing and research facilities are already adequate. Smaller companies are also working toward greater product safety. Inmount Corp. has conducted their testing by retaining on a consulting basis toxicologists and physicians who are specialists in environmental health. Many companies support the Chemical Institute for Toxicology and also participate in research activities of the Manufacturing Chemists Association.

51-0030
GENERAL INFORMATION

Anon
FURTHER EVIDENCE THAT METAL WORKERS RUN A HIGH RISK OF CANCER
Chem. Eng. News 54 (30): 18 (19 July 1976)

A Roswell Park Memorial Institute study of 14,000 cancer patients working in metal-related industries and a control group of office workers shows workers in the primary metal industries are more than twice as likely to get cancer of the prostate, pancreas, kidney or blood. In addition, they have a greater risk for 7 other forms of cancer.

51-0031
GENERAL INFORMATION

Anon
CHEMICAL CARCINOGENS: INDUSTRY ADOPTS CONTROVERSIAL "QUICK" TESTS
Science 192 (4245): 1215-7 (18 June 1976)

A quick test for the mutagenic effect of potentially hazardous chemicals has been developed by a biochemist at the University of California, Berkeley. The method known as the Ames test after its originator is a bacterial system. It is based on the presumption that many carcinogens are likely to be mutagenic. The bacteria are mutants of *Salmonella typhimurium*, which in the presence of a mutagenic chemical, undergo additional mutations. The test is cheap $200 and can be completed in 3 days. Sixty to seventy of the major chemical companies have asked to be supplied with the bacteria according to Dr. Ames. Other quick assays for mutagenic chemicals are based on mammalian cell growth in culture; yeast; or fruit flies. However, the Ames test is most widely used. At present the only official tests are animal experiments which take 2-3 years and cost about $100 thousand. Commercial laboratories doing "quick tests" have had substantial business increase. None of the tests have been endorsed by the National Cancer Institute.

DiGeronimo, M.J. and Antoine, A.D.
METABOLISM OF ACETONITRILE AND PROPIONITRILE BY *NOCARDIA RHODOCHROUS* LL100-21
Appl. Environ. Microbiol. 31 (6): 900-6 (June 1976)

Of the six nitrile compounds tested, acetonitrile together with hydroacrylonitrile and propionitrile was one of the best sources of carbon and nitrogen for growth of *Nocardia rhodochrous* LL100-21. During the growth, acetonitrile degraded through a two-step enzymatic hydrolysis with the sequential formation of acetamide, acetic acid and ammonia. The enzyme system for acetonitrile metabolism was intracellular and inducible.

52-0002
ARSENIC

Sorensen, Elsie M.B.
TOXICITY AND ACCUMULATION OF ARSENIC IN GREEN SUNFISH, *LEPOMIS CYANELLUS*, EXPOSED TO ARSENATE IN WATER
Bull. Environ. Contam. Toxicol. 15 (6): 756-61 (1976)

The extent of the effect of short-term exposures to high concentrations of less potent arsenical, sodium arsenate,on green sunfish was determined. The triplicate experiment showed an increase in cumulative percent mortality for all fish with increasing exposure concentrations. Lethal times for 50% mortality (LT_{50}) were 46 hours for 100 ppm arsenic, 17 hours for 500 ppm arsenic, and 12 hours for 1000 ppm arsenic. Lethal dosage for 50% mortality (LD_{50}) from arsenic exposure were 12 hours for 1000 ppm arsenic, 18 hours for 350 ppm arsenic, 24 hours for 175 ppm arsenic, and 48 hours for 150 ppm arsenic. Results of measurements of arsenic accumulation in the whole fish at the time of death are given and compared with the exposure to arsenic, the time between exposure and mortality, and the condition of the fish.

52-0003
ARSENIC

Morton, William et al
SKIN CANCER AND WATER ARSENIC IN LANE COUNTY, OERGON
Cancer 37 (5): 2523-32 (1976)

In this Lane County, Oregon study, fewer than expected drinking water sources were found to contain high arsenic content. The expected positive association between drinking water arsenic level and skin cancer incidence was not evident. A comparison was made between incidence rates based on confirmed cases in the period 1958 to 1971 and mean water arsenic levels measured in the period 1968 to 1974. Results showed a mean annual incidence rate of 88 per 100,000 for basal cell carcinoma with a 5:4::M:F sex ratio and an increasing risk in urban areas for all cases. For squamous cell carcinoma incidence rate was 50 per 100,000 with a 2::1:M:F sex ratio and no urban bias.

See: 52-0001, Acetonitrile

52-0004
ARSENIC

Lamberton, J.G. et al
A RAPID METHOD FOR THE DETERMINATION OF ARSENIC CONCENTRATIONS IN URINE AT FIELD LOCATIONS
Am. Ind. Hyg. Assoc., J. 37 (7): 418-22 (July 1976)

To prevent further exposure of an individual overexposed to arsenic, a rapid and simple colorimetric method for monitoring arsenic concentrations in the urine of applicators at field locations was developed. Using a portable hood and minimal laboratory facilities, urine samples are combusted in a hot plate oven with MgO and $Mg(NO_3)_2$ to generate arsine. The silver diethyldithiocarbamate (Ag-DDC) method for arsine detection was selected. When used with the MgO-combustion system, the Ag-DDC method allows detection of less than 0.03 ppm inorganic or organic arsenicals with 6% variation from the mean.

52-0005
ARSENIC

Smith, T.J. et al
THE CHEMISTRY OF SULFUR AND ARSENIC IN AIRBORNE COPPER SMELTER PARTICULATES
Bull. Environ. Contam. Toxicol. 15 (6): 651-9 (1976)

The results obtained in this study discount previous assumptions that sulfur oxides are present in copper smelter particulates as sulfates and/or sulfuric acid and that arsenic is present as arsenic trioxide. Analysis of HCl extracts of the small series of air samples collected in a large copper smelter near Salt Lake City, Utah did not reveal the presence of arsenic as arsenic trioxide, arsenic pentoxide or metal arsenites. The authors indicate that arsenic could exist in the copper smelter particulates as arsenic sulfides (or related metal containing compounds) and elemental arsenic (A_4). Their analysis of sulfur species is also discussed in some detail.

Blejer, H.P. and Wagner, W.
CASE STUDY 4: INORGANIC ARSENIC--AMBIENT LEVEL APPROACH TO THE CONTROL OF OCCUPATIONAL CANCERIGENIC EXPOSURES
Ann. N.Y. Acad. Sci. 271: 179-86 (1976)

A review of epidemiological and other findings concerning occupational exposure to inorganic arsenic is presented and summarized. The authors found no data which established an occupationally safe (noncancerigenic) exposure level for inorganic arsenic. They conclude that due to the environmental ubiquity of arsenic, the arsenic body burden should be limited occupationally to exposures of approximately the natural ambient level. They recommend a 2 $\mu g/M^3$ standard on an 8-hour time-weighted average for occupational exposure to inorganic arsenic.

52-0007
ASBESTOS

Lorimer, W.V. et al
ASBESTOS EXPOSURE OF BRAKE REPAIR WORKERS IN THE UNITED STATES
Mt. Sinai J. Med. 43 (3): 207-18 (May-June 1976)

Many garage workers and auto mechanics are regularly exposed to asbestos fibers as a result of work being done on brake linings which contain 33-73% asbestos. This survey of 104 men, employed as brake maintenance workers was conducted on subjects with history of good health. Examination of fibers by optical techniques and electron microscopy showed 15.9 fibers/ml at 3-5 feet as a result of blowing asbestos dust from the brake drums during servicing of the vehicle. In this preliminary study one quarter of the group evidenced abnormalities consistent with asbestosis. One quarter also had restrictive pulmonary function test findings.

52-0008
ASBESTOS

Greenberg, S.D. et al
TYLER ASBESTOS WORKERS PROGRAM
Ann. N.Y. Acad. Sci. 271: 353-64 (1976)

An ongoing study program concerns 890 former workers who had been exposed to amosite asbestos. The plant was in operation between 1954 and 1972. The study program was initiated in 1974. Each former employee is given a very detailed physical examination and undergoes numerous laboratory tests. Sputum cytopathology serves as the heart of the program. Methodology for sampling and analysis is described. Thus far, in this study only one of 344 workers has had a sputum cytopathological diagnosis of squamous carcinoma. Thirteen of this same group of former employees displayed abnormalities in their sputum. Close cytological follow up of these patients will continue. As the program progresses all workers will be examined every 6 months, oftener if cytopathology and clinical findings show a need. In conclusion this method for examining sputum had proved excellent and reliable for early detection of malignant or abnormal lesions of the lung.

52-0009
ASBESTOS

Selikoff, I.J.
LUNG CANCER AND MESOTHELIOMA DURING PROSPECTIVE SURVEILLANCE OF 1249 ASBESTOS INSULATION WORKERS, 1963-1974
Ann. N.Y. Acad. Sci. 271: 448-56 (1976)

Asbestos insulation workers from the New York metropolitan area were observed clinically from 1963 to the end of 1974. Before 1963 there had been no surveillance of asbestos workers. Of the 1249 workers under observation 59 had a diagnosis of bronchogenic carcinoma and 57 of the 59 died. Early diagnosis did not improve the prognosis among these subjects. Forty-nine lung cancers occurred in the 370 workers who were in their labor union as early as 1942, and ten lung cancers occurred in the 879 men who joined the Insulation Workers' Union between 1943-62. Lung cancer was found only in workers who had a history of regular smoking. Nine cases of pleural mesothelioma and 22 cases of peritoneal mesothelioma resulted in 31 deaths. Effective treatment was absent.

52-0010
ASBESTOS

Nicholson, W.J.
CASE STUDY 1: ASBESTOS--THE TLV APPROACH
Ann. N.Y. Acad. Sci. 271: 152-69 (1976)

A review of the development of the Threshold Limit Value (TLV) for asbestos from the earliest proposed standard by the U.S. Public Health Service to the current is given. Epidemiological studies which relate to the development of improved working environment are described yet in all these studies the length of exposure for those with asbestos related diseases is usually not documented. A threshold for carcinogenic effect, risks involved for asbestos workers, the effects of smoking and asbestos diseases, and indirect exposure are discussed. The author states that the present standard has not been adequately enforced and that in many situations workers are exposed to levels much above the current standard. He also feels that the present standard should serve as an impetus to improved engineering controls and as this technology advances lower exposure levels can produce a better standard.

Clayson, D.B.
CASE STUDY 2: BENZIDINE AND 2-NAPHTHYLAMINE--VOLUNTARY SUBSTITUTION OR TECHNOLOGICAL ALTERNATIVES
Ann. N.Y. Acad. Sci. 271: 170-5 (1976)

Twenty-nine published articles on the health hazards of benzidine and 2-naphthylamine are reviewed. References concerned with the carcinogenic effect of the compounds on workers exposed in an industrial environment are discussed, with special attention given to the increased evidence of bladder cancers or tumors. In the case of benzidine the papers are concerned with workers in the British chemical industry, or workers in France employed in factories where only benzidine is manufactured, or workers in the U.S. chemical industry. In the case of 2-naphthylamine there is greater evidence of bladder cancer being induced by this compound according to the author. Both of these compounds are now prohibited from industrial use in the United Kingdom. Certain other European countries have given up the use of 2-naphthylamine. Alternate processes and production methods have been developed by industry to supplant the use of 2-naphthylamine. Alternatives for benzidine are being developed particularly for fabric dyes. Substitutes are needed for its use as a reagent in the test for occult blood.

Pawar, S.S. and Mungikar, A.M.
DIOXANE-INDUCED CHANGES IN MOUSE LIVER MICROSOMAL MIXED FUNCTION OXIDASE SYSTEM
Bull. Environ. Contam. Toxicol. 15 (6): 762-7 (1976)

Female Hindustan strain mice used in these experiments were treated with (1) dioxane or (2) phenobarbital and then dioxane. Livers were excised at the time the animals were sacrificed. Dioxane did not cause any change in relative liver weight, however, liver microsomal protein showed a significant increase. In mice pretreated with phenobarbital followed by dioxane cytochrome b_5 and cytochrome P-450 were elevated due to the increased metabolic activity of the enzyme caused by the drug. Lipid peroxidation in this group of mice was inhibited.

Anon
POSSIBLY, STRATOSPHERIC CHLORINE FROM PHOTOLYZED CHLOROFLUOROCARBONS MAY REACT WITH NO_2 TO FORM CHLORINE NITRATE
Environ. Sci. Technol. 10 (8): 731 (August 1976)

At a National Bureau of Standards conference on photochemistry information was presented on the possibility that stratospheric chlorine from photolysis of chlorofluorocarbons may react with nitrogen dioxide to form chlorine nitrate ($ClONO_2$). This could result in the ozone depletion predictions being lowered by 20-30% according to Mario Molina of the University of California. He also told the conference that chlorofluorocarbon sinks such as trapping in snow, ocean dispersal or reaction with ions are not comparable with the total picture of stratospheric photolysis. Possibility of tropospheric "sinks" need to be considered.

52-0014
HALOETHERS

Anon
TESTS SHOW NO FORMATION OF THE CARCINOGEN BISCHLOROMETHYL ETHER IN AIR
Chem. Eng. News 54 (32): 20 (2 August 1976)

There were reports last year from the American Textile Manufacturers Institute and the National Institute for Occupational Safety and Health (NIOSH) indicating that traces of bischloromethyl ether had formed in reactions of hydrochloric acid and formaldehyde in textile finishing. But investigations performed by Dow Chemical failed to reveal any trace of bischloromethyl ether in air in a variety of ionic chloride and formaldehyde systems.

52-0015
HALOETHERS

Lemen, R.A. et al
CYTOLOGIC OBSERVATIONS AND CANCER INCIDENCE FOLLOWING EXPOSURE TO BCME
Ann. N.Y. Acad. Sci. 271: 71-80 (1976)

This follow-on study on bis (chloromethyl) ether BCME was conducted at the same chemical facility as an earlier study initialed by NIOSH. The firm is involved in the preparation of anion-exchange resins. Sputum cytology, to determine the presence of neoplastic or atypical cells, was employed in carefully controlled experiments. A retrospective study of workers with five years of employment in the plant was undertaken to determine the incidence of lung cancer from long term exposure. In both studies there is indication that the workers at this plant have an unusually high malignancy risk. Results are discussed in detail.

52-0016
HEXACHLOROBENZENE

Plimmer, J.R. and Klingebiel, U.I
PHOTOLYSIS OF HEXACHLOROBENZENE
J. Agri. Food Chem. 24 (4): 721-3 (1976)

Primary sources of hexachlorobenzene entry into the environment may be from waste streams during hydrocarbon manufacture or from polyvinyl chloride plasticized with HCB. Contamination from its use as a fungicide on seed grains is minimal. In these experiments, decomposition of this compound was extremely slow when samples of solid HCB were exposed to direct sunlight. At the same time, after 4.5 hours of exposure to sunlight 17% had volatilized. Photolysis was determined by gas-liquid chromatography. Photodecomposition was sensitized by diphenylamine. Decomposition products are identified.

52-0017
HEXACHLOROBENZENE

Geike, F. and Parasher, C.D.
EFFECT OF HEXACHLOROBENZENE ON SOME GROWTH PARAMETERS OF *CHLORELLA PYRENOIDOSA*
Bull. Environ. Contam. Toxicol. 15 (6): 670-7 (1976)

Degradation products of hexachlorobenzene have not been found in plants and soil. In these experiments freshwater alga-chlorella pyrenoidosa- are used to study the effect of HCB on some growth parameters of plants. Repeated experiments on samples incubated for 46 hours with specific amounts of the compound showed a decrease in all growth parameters studied. Chlorophyll content and total nitrogen were most strongly affected. Long term incubation of the algae for a period of 3 months showed a reverse effect. Growth was greatly enhanced by all concentrations of HCB. Total nitrogen was also enhanced at a concentration of 0.1 ppm.

Laseter, J.L. et al
AN ECOLOGICAL STUDY OF HEXACHLOROBENZENE (HCB)
New Orleans University, La. Dept. of Biological Sciences (9 April 1976) 74p.
EPA/560/6-76/009 PB-252 651/5WJ PC$4.50/MF$2.25

Hexachlorobenzene (HCB) has been found in the environment in southeastern Louisiana in addition to other parts of the world. In this region it is a byproduct of the petro-chemical industry. HCB is a fungicide and has been found to accumulate in fatty tissue of wild and domestic animals. It has had toxic effects upon humans. A number of cases of porphyria cutanea tarda were traced to ingestion of treated grain. In this study, soil, water and organism samples were collected periodically in 1974 and 1975 from sites in southeastern Louisiana, with emphasis along the Mississippi River and an industrial region of known contamination of HCB near Geismar, Louisiana. Maximum HCB concentrations in water from the two areas were 90.3 and 74.9 microgram/l (ppb). Maximum HCB concentrations in soil from the two areas were 874 and 53,130 microgram/Kg (ppb). Laboratory experiments with the compound included acute toxicity studies in aquatic systems and through injection in fish and crayfish. Accumulation and depuration rates were determined and observations made with histological slides of tissue.

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, Ecology, p.519 (2 August 1976)]

52-0019
HEXACHLOROBUTADIENE

Yurawecz, M.P. et al
DETERMINATION OF HEXACHLORO-1,3-BUTADIENE IN SPINACH, EGGS, FISH, AND MILK BY ELECTRON CAPTURE GAS-LIQUID CHROMATOGRAPHY
J. Assoc. Off. Anal. Chem. 59 (3): 552-8 (1976)

Ten million pounds of hexachlorobutadiene are generated annually in the U.S. as hex waste from the manufacture of perchlorethylene. Disposal is for the most part in deep wells, landfills or land-locked lagoons. This method for determining HCBD residues in food has been developed by the FDA. It is being used in the Agency's survey to determine the extent of contamination by HCBD in food originating near perchlorethylene plants. The method has been tested on 4 commodities at laboratories in Dallas and San Francisco. Sixteen fish samples obtained by the FDA were found positive to HCBD. The fish had been obtained from waters in the areas of New Orleans, Buffalo, Minneapolis and New York. Principal source of contamination was the lower Mississippi basin where there were perchlorethylene plants.

52-0020
HEXACHLOROBUTADIENE

Yip, G.
SURVEY FOR HEXACHLORO-1,3-BUTADIENE IN FISH, EGGS, MILK, AND VEGETABLES
J. Assoc. Off. Anal. Chem. 59 (3): 559-61 (1976)

This test survey conducted by the FDA was inaugurated to determine the effect of hexachlorobutadiene on foods grown near perchloroethylene manufacturing plants. Ten plant sites were selected, 4 in Louisiana, 3 in Texas, one in Wichita, Kansas; Louisville, Kentucky; and, Pittsburg, California. Eighty-four food samples were collected from within a 25 mile radius of the plants. The samples were analyzed for HCBD by gas chromatography and the results indicate that eggs and vegetables produced near perchloroethylene plants are not likely to be contaminated. In this survey 89% of the freshwater fish contained HCBD residues, compared with 10% of the salt water fish. Milk was free of contamination.

Toth, B. et al
PRODUCTION OF INTESTINAL AND OTHER TUMORS BY 1,2-DIMETHYLHYDRAZINE DIHYDROCHLORIDE IN MICE
Am. J. Pathol. 84 (1): 69-86 (July 1976)

Swiss albino mice were divided into two groups. Each group was made up of 50 female and 50 male mice. Group I was given 1,2-dimethylhydrazine as a single injection 20 μg/g body weight. At this dosage, survival was only slightly reduced in this group. One female mouse developed a malignant tumor in the large intestine and one male mouse developed an adenoma of the cecum. Tumors appeared in blood vessels and liver in those animals subjected to a single application or when DMH was administered orally in the drinking water for the full lifetime. Group II, equivalent in number and make up and dosage received 10 weekly doses of DMH. In these animals 82% of the females developed tumors of the large intestine. In the males 90% developed such tumors. No significant difference in tumor distribution was observed between the sexes.

52-0022
LIQUEFACTION AND GASIFICATION OF COAL

Anon
OCCIDENTAL TO DEMONSTRATE ITS COAL LIQUEFACTION PROCESS
Coal Age 81 (7): 38 (1976)

The Energy Research and Development Administration has funded Occidental Research Corporation with $3.78 million to demonstrate and test its proprietary process for producing liquid fuel. This rapid flash pyrolysis method employs coal particles in a mixture of coal and char carried in a gaseous stream. It is said to produce a higher liquid yield. The reactor has been specially designed for the process. Three tons of coal per day is the capacity of the research test facility unit at La Verne, California. The Commonwealth of Kentucky has a cost-sharing joint venture with Occidental to design a 250-tpd demonstration plant using this process. Data generated by the ERDA-sponsored project will be used for the joint venture and directed toward an engineering and economic feasibility study.

52-0023
LIQUEFACTION AND GASIFICATION OF COAL

Anon
SOME 640 TONS OF HIGH-SULFUR, CAKING BITUMINOUS COAL HAVE BEEN GASIFIED
Chem. Eng. News 54 (32): 20 (2 August 1976)

The Institute of Gas Technology in Chicago has demonstrated a process for coal gasification at the Hygas pilot plant which has overcome the problem of caking in bituminous coals at high temperatures. The process utilizes a pretreating step at 800°F before the coal is fed to the reactor. No supplemental sources of heat were required nor was hydrogen employed. Some 640 tons of high sulfur bituminous coal were gasified over a 9 day period.

Anon
N. DAKOTA WATER BOARD OKs COAL PLANTS, REJECTS COAL GAS
Coal Age 81 (7): 29 (July 1976)

An application for the construction of a coal gasification project in Dunn County was rejected by the North Dakota Water Commission. The design of the project is geared to a capacity of 12 million tons per year. A regional environmental impact statement has yet to be completed by the U.S. Dept. of the Interior. Governor Link recommended delaying the gasification project until North Dakota has had an opportunity to review the Interior Departments' recommendations.

52-0025
LIQUEFACTION AND GASIFICATION OF COAL

Anon
FLUOR CONTRACTED TO DESIGN COAL-TO-LIQUID FUEL COMPLEX
Coal Age 81 (7): 43-4 (July 1976)

The Energy Research and Development Administration has funded an 18 months study for a conceptual design for a large complex to convert high sulfur Appalachian coals to clean liquid fuels. The contract calls for financial data on both capital investment and operating costs. A small scale plant design capable of demonstrating feasibility of a full-scale commercial system is also a part of the work funded. The project covers all that is involved in the process from the mine to the liquid fuel. The $1.9 million contract to Fluor Engineers and Constructors requires the investigation of processes and equipment best suited to a plant which could produce 50,000 bbl per day of synthetic crude oil.

52-0026
MODEL ECOSYSTEMS

Penumalli, B.R. et al
LARGE SCALE SYSTEMS APPROACH TO ESTUARINE WATER QUALITY MODELLING WITH MULTIPLE CONSTITUENTS
Ecological Modelling 2: 101-15 (1976)

A two dimensional estuarine water quality model for coupled constituents was developed for simulating concentration distributions. The model was applied to the process of nitrofication (nitrogen cycle) in Corpus Christi Bay on the Gulf Coast of Texas and utilized active field data. Results presented for five constituent species of nitrogen: organic nitrogen, ammonia, nitrite, nitrate and algae. In this preliminary study, the model appears capable of simulating all forms of nitrogen concentrations, provided the reaction rate coefficients and all the sources are properly taken into account.

52-0027
MODEL ECOSYSTEMS

Shahane, A.N.
INTERDISCIPLINARY MODELS OF WATER SYSTEMS
Ecological Modelling 2: 117-45 (1976)

Interdisciplinary concepts and formulations involved in the modeling of water systems are presented. Various pathways of model building procedures are outlined with associated ecological economic, social, political, technological and environmental models are discussed with quantitative examples given. The author points out that modeling success depends on the data base, computer capacity, the validity of assumptions, estimation procedure for rate coefficients or arbitrarily chosen weights and the verification of the outcome.

Van Duuren, B.L. and Banerjee, S.
COVALENT INTERACTION OF METABOLITES OF THE CARCINOGEN TRICHLOROETHYLENE IN RAT HEPATIC MICROSOMES
Cancer Res. 36: 2419-22 (July 1976)

In this study, evidence is obtained for the covalent binding of trichloroethylene (TCE) metabolites to rat liver microsomal proteins in vitro. The results indicate that the binding occurs by means of an expoxide or other related electrophilic species. The authors refer to previous experimental studies showing that some indirect-acting carcinogens are metabolized to their activated carcinogenic intermiediates by means of a cytochrome P-450-dependent mixed-function oxidase. They mention further that intermediate exposides from such indirect-acting carcinogens possible interact covalently at nucleophilic sites in nucleic acids and proteins, and that one or more of these processes are probably responsible for their carcinogenic activity.

Anon
AN 8-FOOT-DIAMETER, 2350-FOOT-DEEP BOREHOLE WILL BE SUNK INTO AN OIL SHALE DEPOSIT
Chem. Eng. News 54 (32): 20 (2 August 1976)

At last scientists will be afforded the chance to analyze geological forces and stresses acting on deep shales. Geologic and environmental information on deep oil shale deposits in Western Colorado's Piceance Creek Basin will be gathered for the Bureau of Mines by means of an 8-foot-diameter, 2350-foot-deep borehole sunk near Meeker, Colorado by Rowan Drilling.

52-0030
SHALE OIL EXTRACTION AND REFINING

Anon
ERDA OIL SHALE TESTS ARE PRODUCING OIL
Chem. Eng. News. 54 (31): 7 (26 July 1976)

At its second successful in-situ test well experiment at Rock Springs, Wyoming, the Energy Research & Development Administration (ERDA) has produced more than 100 bbl of oil extracted from oil shale. A more advanced fracturing process for the shale, using newely developed explosives, and a new method of igniting the oil shale were employed in this test. This project is designed to maximize oil production and low quality but usuable gas with a heating value of less than 125 Btu/ft^3 also is generated. The project manager indicated that the technology is still a long way from commercialization. The next experiment, scheduled for the fall, will be directed toward controlling the movemement of the process along the oil shale deposit which has not yet been achieved.

52-0031
VINYL CHLORIDE

Anon
"IN-KETTLE COMPOUNDING" OF CALCIUM CARBONATE FILLERS AND POLYVINYL CHLORIDE
Chem. Eng. News 83 (16): 35 (2 August 1976)

At its Plainsville, Ohio resin plant, Robintech Inc. of Ft. Worth, Texas has begun employing their new process of "in-kettle compounding" of calcium carbonate fillers and polyvinyl chloride during polymerization. With the new technique a more porous polymer, which is easier to strip of unreacted vinyl chloride monomer (VCM) by using heat and vacuum, is obtained in about 20% less time. At the Plainesville plant, expansion by increased condensing and drying capacity, without the addition of new reactors, is expected to raise the capacity from 220 million to 350 million pounds per year.

52-0032
VINYL CHLORIDE

Anon
MEANWHILE, ROBINTECH APPEARS PRIMED TO START VINYL CHLORIDE MONOMER
Chem. Eng. News 83 (16): 35 (2 August 1976)

Robintech Inc. is expected to buy Allied Chemical's vinyl chloride monomer (VCM) plant at Baton Rouge, La. In addition, they are negotiating the sale of their share of Shintech Inc., a 220-million-lb/yr PVC plant in Freeport, Texas, a joint venture with Japan's Shin-Etsu Chemical Company. Shin-Etsu will become full owner, preferring to strengthen polymer production, while Robintech will intergrate backward to VCM production.

52-0033
VINYL CHLORIDE

Infante, P.F.

ONCOGENIC AND MUTAGENIC RISKS IN COMMUNITIES WITH POLYVINYL CHLORIDE PRODUCTION FACILITIES

Ann. N.Y. Acad. Sci. 271: 49-57 (1976)

Three Ohio communities that have production facilities for the manufacture of polyvinyl chloride are the locale for this study. Birth defects in children born to mothers who lived in these three cities were carefully observed and recorded for the 4 year period 1970-73. The data from the communities was compared with the data for the state as a whole or data for the balance of the counties in which these three cities are located. The results suggest that mothers in these 3 cities gave birth to children in which a greater number of congenital malformations appeared. Anomalies of the central nervous system seem to be of greatest concern. Since many underlying factors could be responsible for the effects, these preliminary findings cannot be linked to PVC production, but they do indicate need for further study.

52-0034
VINYL CHLORIDE

Christiani, D.C.

INDUSTRIAL EXPOSURE TO VINYL CHLORIDE

N. Engl. J. Med. 295 (4): 233 (22 July 1976)

Commenting on vinyl chloride as one of the most serious health hazards faced by American workers today (see: CATS 42-0024), the author expresses alarm at the inadequacy of the number of safety inspectors (about 2000) available to visit the number of work places (about 4 million). He also emphasizes the inadequacy of protective clothing, masks and safety education provided; the lack of incentive provided by the fines levied for violations of safety standards for corrections of these violations; and the lack of training for physicians in occupational diseases within medical-school curricula.

52-0035
VINYL CHLORIDE

Waxweiler, R.J. et al
NEOPLASTIC RISK AMONG WORKERS EXPOSED TO VINYL CHLORIDE
Ann. N.Y. Acad. Sci. 271: 40-8 (1976)

In order to assess the magnitude and spectrum of neoplastic effects in workers to vinyl chloride, the National Institute for Occupational Safety and Health (NIOSH) undertook an epidemiological evaluation of industrial hygiene surveys, retrospective cohort analyses of mortality patterns, and histopathologic evaluation of tumors. The authors discuss the results of this study and conclude that an excessive number of deaths due to cancer of the liver, lung, and lymphatic and central nervous system were found for workers exposed to vinyl chloride. They point to the epidemiological and histopathological evidence indicating vinyl chloride as the causal agent in the etiology of such excessive cancer risk. They stress the need for performing animal bioassays prior to introducing chemical and other agents into the industrial or community environment.

52-0036
VINYL CHLORIDE

Hill, R.H. et al
GAS-CHROMATOGRAPHIC DETERMINATION OF VINYL CHLORIDE IN AIR SAMPLES COLLECTED ON CHARCOAL
Anal. Chem. 48 (9): 1395-8 (August 1976)

A sampling and analytical method for vinyl chloride which employs a tube filled with a solid sorben, particularly charcoal, as a personal sampling device was developed. Useful for routine analysis of large numbers of samples, this method makes use of commercially available and relatively inexpensive equipment for sampling and analytical determination of vinyl chloride in workplace air.

52-0037
NITROSAMINES

Fine, D.H. et al
N-NITROSODIMETHYLAMINE IN AIR
Bull. Environ. Contam. Toxicol 15 (6): 739-46 (1976)

Research studies published in 1975 showed N-nitrosodimethylamine to be present in the air and in the aquatic environment. A research team found high levels of DMN in the air in Baltimore, MD and in Belle, West VA. The authors of this paper conducted parallel experiments using two entirely different collection and analyses techniques. One series of tests was conducted near the Food Manufacturing Corporation's facility in Baltimore since they use DMN as an intermediate in the preparation of unsymetrical dimethylhydrazine. At the FMC property adjacent to this plant air values as high as 32,000-36,000 ng/m^3 were found. Upwind of the property the levels decreased between the hours of 3:45 a.m. and 12:35 p.m. The opposite trend was observed in downtown Baltimore. FMC's own analytical team had reported similar results. In Belle, West VA, both du Pont and Union Carbide use or manufacture dimethylamine. The highest DMN level found there was 980 ng/m^3. Tests also run by du Pont's own laboratory confirmed the data.

52-0038
NITROSAMINES

Warthesen, J.J. et al
N-NITROSOPYRROLIDINE COLLECTED AS A VOLATILE DURING HEAT-INDUCED FORMATION IN NITRITE-CONTAINING PORK
J. Agric. Food Chem. 24 (4): 892-4 (1976)

This investigation on the formation of N-nitrosopyrrolidine in fresh pork containing sodium nitrite was conducted to study the effect of proline or putrescine as precursors in the formation of the compound. Samples were analyzed by gas chromatography and mass spectrometry. In the uncooked pork N-nitrosopyrrolidine was present at an average rate of 19 ppb. After the samples had been cooked it was found that 20-40% of the total compound was given off as a volatile. Addition of 0.1% putrescine or proline added to the uncooked pork resulted in the production of higher levels of N-nitrosopyrrolidine after cooking.

Havery, D.C. et al
SURVEY OF FOOD PRODUCTS FOR VOLATILE N-NITROSAMINES
J. Assoc. Off. Anal. Chem. 59 (3): 540-6 (1976)

A gas-liquid chromatographic method using a modified thermionic detector was employed in this survey of food products which might contain nitrites. Samples of baby food, cheeses (imported), fats and oils, total diet products, pork products and variety meats were analyzed. In this group no nitrosamines were detected except in lard heated to 340°F for 10 minutes. Icelandic national foods were also sampled because some of their food preparation methods could lead to very high amounts of nitrosamines being present. However, none were detected in these national foods. Nitrosamines which had been added to samples of all the above mentioned foods at 10 ppb were 80-90% recoverable. N-nitrosopyrrolidine was found in fried bacon at levels ranging from 7 to 139 ppb. No nitrosamines were found in raw bacon.

Crockett, P.W.
TOXICITY OF GASEOUS HALOGATED ORGANIC COMPOUNDS (A BIBLIOGRAPHY WITH ABSTRACTS)
National Technical Information Service, Springfield, Va., (June 1976) 93p.
NTIS/PS-76/0432/5WJ PC$25.00/MF$25.00

Subject areas include toxicological studies on halogenated hydrocarbon gases used as fire extinguishers, anesthetics, solvents, pesticides, and aerosol propellants. (This updated bibliography contains 88 abstracts, 18 of which are new entries to the previous edition.)

[Abstract in: NTIS Weekly Government Abstracts, Medicine and Biology, p.500 (26 July 1976)]